INDEPENDENT ORBITER ASSESSMENT

ANALYSIS
OF THE
MECHANICAL
ACTUATION
SUBSYSTEM

30 NOVEMBER 1987

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MCDONNELL DOUGLAS ASTRONAUTICS COMPANY ENGINEERING SERVICES- HOUSTON DIVISION

SPACE TRANSPORTATION SYSTEM ENGINEERING AND OPERATIONS SUPPORT

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CONTENTS

		Page
1.0	EXECUTIVE SUMMARY	ī
2.0	INTRODUCTION	4
	2.1 Purpose	4
	2.2 Scope	4
	2.3 Analysis Approach	4
	2.4 MAS Ground Rules and Assumptions	5
3.0	SUBSYSTEM DESCRIPTION	6
	3.1 Design and Function	6
	3.2 Interfaces and Locations	9
	3.3 Hierarchy	10
4.0	ANALYSIS RESULTS	39
	4.1 - Air Data Probe (ADP)	40
	4.2 - Elevon Seal Panel (ESP)	41
	4.3 - External Tank Umbilical (ETU)	41
	4.4 - Ku-Band Deploy (KBD)	41
	4.5 - Payload Bay Doors (PBD)	41
	4.6 - Payload Bay Radiators (PBR)	41
	4.7 - Personnel Hatches (PH)	41
	4.8 - Vent Door Mechanism (VDM)	41
	4.9 - Startracker Door Mechanism (SDM)	41
5.0	REFERENCES	42
APPE	NDIX A ACRONYMS	A-1
APPE	NDIX B DEFINITIONS, GROUND RULES, AND ASSUMPTIONS	B-1
	B.1 Definitions	B-2
	D.D 120100 20101 000000 00000 00000 00000 00000 000000	B-4
	B.3 Subsystem Specific Ground Rules and Assumptions	B-6
APPE	NDIX C DETAILED ANALYSIS	C-1
	C.1 - Air Data Probe (ADP)	C-2
	C.2 - Elevon Seal Panel (ESP)	C-220
	C.3 - External Tank Umbilical (ETU)	C-227
	C.4 - Ku-Band Deploy (KBD)	C-302
	C.5 - Payload Bay Doors (PBD)	C-507
	C.6 - Payload Bay Radiators (PBR)	C-608
	C.7 - Personnel Hatches (PH)	C-645
	C.8 - Vent Door Mechanism (VDM)	C-667
	C.9 - Startracker Door Mechanism (SDM)	C-695
A DDE	WINTY D. DOMENMINI CRIMICAL THEMS	D-1

		Page
jej za iz i i		
	List of Figures	
Figure	1 - MAS OVERVIEW ANALYSIS SUMMARY	3
Figure		11
Figure		12
Figure		13
Figure	5 - ELEVON SEAL PANEL LINKAGE	14
Figure	6 - ELEVON SEAL PANEL LINKAGE OVERVIEW	15
Figure	7 - ET UMBILICAL DOOR MECHANISM	16
Figure	8 - ET UMBILICAL DOOR MECHANISM OVERVIEW	17
Figure	9 - Ku-BAND ANTENNA DEPLOYMENT SUBSYSTEM 10 - Ku-BAND ANTENNA DEPLOYMENT OVERVIEW	18
Figure	10 - Ku-BAND ANTENNA DEPLOYMENT OVERVIEW	19
Figure	11 - PAVIOAD BAV DOOR MECHANISM	20
Figure	12 - PAYLOAD BAY DOOR MECHANISM OVERVIEW	21
Figure	13 - PAYLOAD BAY RADIATOR DEPLOY SUBSYSTEM	22
Figure	14 - RADIATOR DEPLOY SYSTEM	23
Figure	15 - RADIATOR DEPLOYMENT MECHANISM	24
Figure	16 - POWER DRIVE UNIT (TYPICAL)	25
Figure	17 - RADIATOR LATCH SYSTEM	26
Figure	15 - RADIATOR DEPLOYMENT MECHANISM 16 - POWER DRIVE UNIT (TYPICAL) 17 - RADIATOR LATCH SYSTEM 18 - RADIATOR LATCH HOOK MECHANISM	27
rigure	19 - PLB RADIATOR EPD&C	28
Figure	20 - PLB RADIATOR PANEL	29
Figure	21 - PERSONNEL HATCH FUNCTIONAL DIAGRAM 22 - INGRESS/EGRESS HATCH	30
Figure	22 - INGRESS/EGRESS HATCH	31
Figure	23 - AIRLOCK HATCH	32
Figure	24 - HATCH SEALS	33
Figure	25 - VENT DOOR MECHANISM	34
Flaure	26 - VENT DOOR MECHANISM LOCATION	35
Figure	27 - VENT DOOR MECHANISM OVERVIEW	36
Figure	27 - VENT DOOR MECHANISM OVERVIEW 28 - STARTRACKER DOOR MECHANISM	37
Figure	29 - STARTRACKER DOOR MECHANISM OVERVIEW	38
	List of Tables	
		Page
Table I -	SUMMARY OF POSSIBLE FAILURE MODES AND CRITICALITIES	39
Table II -	SUMMARY OF POTENTIAL CRITICAL ITEMS	39
	IOA ANALYSIS (APPENDIX C) WORKSHEET NUMBERS	40

Independent Orbiter Assessment Analysis of the MAS Subsystem

1.0 EXECUTIVE SUMMARY

The McDonnell Douglas Astronautics Company (MDAC) was selected in June 1986 to perform an Independent Orbiter Assessment (IOA) of the Failure Modes and Effects Analysis (FMEA) and Critical Items List (CIL). Direction was given by the STS Orbiter and GFE Projects Office to perform the hardware analysis using the instructions and ground rules defined in NSTS 22206. Instructions for Preparation of FMEA and CIL, change 2, PRCBD 40107D, 28 March, 1987. The IOA approach features a top-down analysis of the hardware to determine failure modes, criticality, and potential critical items. To preserve independence, this analysis was accomplished without reliance upon the results contained within the NASA FMEA/CIL documentation. This report documents (Appendix C) the independent analysis results corresponding to the Orbiter Mechanical Actuation System (MAS) hardware.

The MAS hardware is required for performing critical functions of crew ingress/egress, air data parameter data acquisition, thermal protection of the elevon spar, fittings and External Tank (ET) umbilical cavities, communications support via the Tracking and Data Relay Satellite, target tracking during rendezvous and proximity operations, access for cargo to the payload bay, support for the ATCS and enables pressurized control of unpressurized compartments during transient pressure periods and environmental control during static pressure periods. Specifically, the MAS hardware consists of the following components:

- o Air Data Probe (ADP)
- o Elevon Seal Panel (ESP)
- o External Tank Umbilical (ETU)
- o Ku-Band Deploy (KBD)
- o Payload Bay Doors (PBD)
- o Payload Bay Radiators (PBR)
- o Personnel Hatches (PH)
- o Vent Door Mechanism (VDM)
- o Startracker Door Mechanism (SDM)

The IOA analysis process utilized available MAS hardware drawings and schematics for defining hardware assemblies, components, and hardware items. Each level of hardware was evaluated and analyzed for possible failure modes and effects. Criticality was assigned based upon the severity of the effect for each failure mode.

Figure 1 presents a summary of the failure criticalities for each of the nine major subdivisions of the MAS. A summary of the number of failure modes, by criticality, is also presented below with Hardware (HW) criticality first and Functional (F) criticality second.

Summary	of	IOA F	ailure	Modes	By Cri	tical	ity (H	W/F)
Criticality	:	1/1	2/1R	2/2	3/1R	3/2R	3/3	TOTAL
ADP	:	0	0	0	143	o	69	212
ESP	:	6	0	0	0	0	1	7
ETU	:	23	30	0	0	0	20	73
KBD	:	3	6	1	111	42	37	200
PBD	:	25	45	2	4	2	20	98
PBR	:	0	0	0	14	0	22	36
PH	:	1	0	0	12	3	5	21
VDM	:	0	26	0	0	0	1	27
SDM	:	0	0	0.	6	0	5	11
TOTAL	:	58	107	3	290	47	180	685

For each failure mode identified, the criticality and redundancy screens were examined to identify critical items. A summary of Potential Critical Items (PCIs) is presented as follows:

Criticality	y :	1/1	2/1R	2/2	3/1R	3/2R	TOTAL
ADP	:	0	0	0	143	o	143
ESP	:	6	0	0	0	0	6
ETU	:	23	30	0	0	0	53
KBD	:	3	6	1	110	42	162
PBD	:	25	45	2	0	0	72
PBR	:	0	0	0	0	0	0
PH	:	1	0	0	10	3	14
VDM	:	0	26	0	0	0	26
SDM	:	0	1 o 1	0	0	0	0

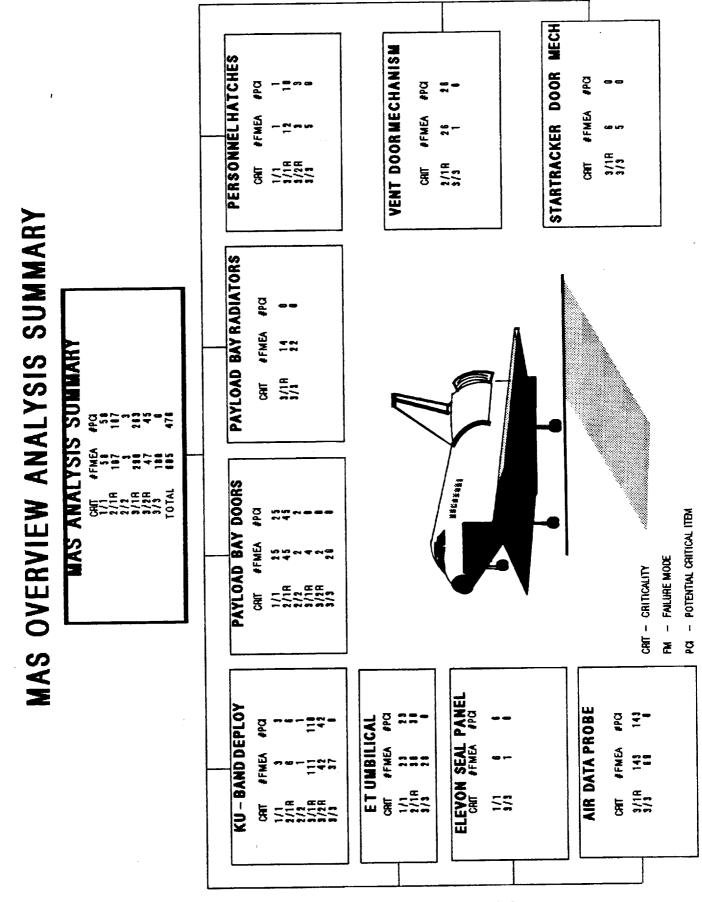


Figure 1 - MAS OVERVIEW ANALYSIS SUMMARY

2.0 INTRODUCTION

2.1 Purpose

The 51-L Challenger accident prompted the NASA to re-address safety policies, concepts, and rationale being used in the National Space Transportation System (NSTS). The NSTS Office has undertaken the task of re-evaluating the FMEA/CIL for the Space Shuttle design. The MDAC is providing an independent assessment of the Orbiter FMEA/CIL re-evaluation results for completeness and technical accuracy.

2.2 Scope

The scope of the independent FMEA/CIL assessment activity encompasses those Shuttle Orbiter subsystems and GFE hardware identified in the Space Shuttle Independent FMEA/CIL Assessment Contractor Statement of Work. Each subsystem analysis addresses hardware, functions, internal and external interfaces, and operational requirements for all mission phases.

2.3 Analysis Approach

The independent analysis approach is a top-down analysis utilizing as-built drawings to breakdown the respective subsystem into components and low-level hardware items. Each hardware item is evaluated for failure mode, effects, and criticality. These data are documented in the respective subsystem analysis report, and are used to assess the NASA and Prime Contractor FMEA/CIL re-evaluation results. The IOA analysis approach is summarized in the following Steps 1.0 through 3.0. Step 4.0 summarizes the assessment of the NASA and Prime Contractor FMEAs/CILs to be performed and documented at a later date.

- Step 1.0 Subsystem Familiarization
 - 1.1 Define subsystem functions
 - 1.2 Define subsystem components
 - 1.3 Define subsystem specific ground rules and assumptions
- Step 2.0 Define subsystem analysis diagram
 - 2.1 Define subsystem
 - 2.2 Define major assemblies
 - 2.3 Develop detailed subsystem representations
- Step 3.0 Failure events definition
 - 3.1 Construct matrix of failure modes
 - 3.2 Document IOA analysis results

Step 4.0 Compare IOA analysis data to NASA FMEA/CIL

- 4.1 Resolve differences
- 4.2 Review in-house 4.3 Document assessment issues
- 4.4 Forward findings to Project Manager

MAS Ground Rules and Assumptions

The MAS ground rules and assumptions used in the IOA are defined in Appendix B. The subsystem specific ground rules were defined to limit the analysis to single-failed-parts for each failure mode. A subset of the "failure mode" and "causes" keywords were identified for the MAS team. This allowed for commonality in the analysis results.

3.0 SUBSYSTEM DESCRIPTION

3.1 Design and Function

The MAS consists of the electrical power, display, control and mechanism hardware associated with the ADP, ESP, ETU, KBD, PLD, PBR, PH, VDM and SDM. Figure 2 shows this breakdown. More specifically, the MAS consists of the following components:

1. The Air Data Probe (ADP) consists of hardware required to sense atmospheric conditions and provide digital data to the GNC subsystem for display and control of the Orbiter during the Terminal Area Energy Management (below 14K altitude and Mach 5) and landing phase. Pressure data is provided below Mach 2.5 to compute angle of attack, acceleration, Mach/clean air mass velocity, equivalent and true airspeed, barometric altitude, and descent rate. Prior to this point the flight parameters are computed using inertial sensed acceleration data and a ground/airborne computed state vector. A temperature sensor on the head of the probe was designed to provide outside air temperature to be used to compute the true and equivalent airspeeds. This data is no longer used by the Orbiter GNC subsystem.

The Mechanical Actuation Assembly consists of a probe housing mounted to the Orbiter Inner Mold Line and contains the dual operational redundant three phase AC motors, reduction gear drive and mechanical linkage required to rotate the probe mast from its stowed position to its deployed position in the Orbiter air stream. A three position lever-lock switch for each probe allows the pilot or commander to deploy the probe and turn the heaters on if required. Deployment will occur within 15 seconds with two motors operating or 30 seconds with only one motor operating. The two motors for each probe are powered by seperate Main AC buses so that any one main AC bus can be used to deploy at least one ADP. When the probe is fully deployed, a limit switch is closed which provides feedback to the Motor Control Assembly which then removes power from the motors. This same Motor Control Assembly signal which removes power from the motors also closes a set of relays that enable the heater function of the three position switch. All three heaters in any one probe are powered by the same Forward Power Controller in the Orbiter. In order to stow either ADP, a separate two position lever-lock switch must be activated to enable the stow position of the deploy/heat switch. When fully stowed, redundant stow limit switches will provide a signal to the Motor Control Assembly to remove power from the motors. Reference Figure 3 and Figure 4.

2. Elevons may be deflected from 0 to 40 degrees up (negative) and 0 to 25 degrees down (positive). As the elevons traverse the 65 degrees, the Elevon Seal Panels (ESP) track the elevons and limits heat flow to the elevon spar and fittings. There are 34 outboard and inboard Elevon Seal Panel linkage mechanisms used to move the 30 Elevon Seal Panels. The linkage mechanism is attached to the elevon with a clevis and is attached to the Elevon Seal Panel with another clevis. Thus the mechanism is driven by elevon displacement and maintains appropriate clearances between the edge of the elevon and the Elevon Seal Panel over the 65 degrees of elevon movement. Reference Figure 5 and Figure 6.

3. The Orbiter External Tank Umbilical (ETU) Doors protect the aft Orbiter ET Umbilical Cavities from aerodynamic heating. The ET Umbilical Cavities contain the aft Orbiter/ET attachment points, the LOX and LH2 feedlines, and electrical connectors. The two ET Umbilical Doors are held open during ascent by two centerline latches.

These latches have to be released before the doors can be closed. Each door is closed by an actuator and mechanical linkages. On the inside of each cavity are three uplock latches which engage three uplock rollers on each door. The latches prevent the door from vibrating or re-opening. The Umbilical Doors are closed and latched by the crew manually except in the event of an RTLS or contingency abort when the closure sequence is done by the GNC software. Reference Figure 7 and Figure 8.

- 4. The Ku-Band Antenna is utilized to support communications via the Tracking and Data Relay Satellite or to support target tracking during rendezvous and proximity operations. The Ku-Band Deploy (KBD) Mechanism facilitates the Ku-Band Antenna as it performs these dual functions. The Deployment Mechanism consists of the Deployed Assembly, the Deployment Mechanism Subsystem and the Electronics Assembly 1. The Electronics Assembly is located in the Forward Avionics Bay 3A. All other components are located on the Starboard Payload Bay Sill Longeron at approximately Z=410, X=589, and Y=100. Deployed Assembly consists of the Antenna Dish, Deployed Electronics Assembly, Gimbal Mechanism, Gimbal Lock Mechanism, 2 Lock Pins, 2 Motors and 2 Microswitches. The Deployment Mechanism Subsystem consists of an Actuator Assembly with 2 motors, differential and gear box and a Deployment Mechanism with 2 deploy/stow limit switches, housing, input/output shaft, balls, Hardstop and Jettison Assembly with guillotine wire cutter and Structural Separation Systems, and frangible nut/bolt. Reference Figure 9 and Figure 10.
- 5. The Payload Bay Doors (PBD) are comprised of left-hand and right-hand doors hinged at the Orbiter midfuselage and latched at the forward and aft fuselage bulkheads. The left and right doors also are latched along the top centerline.

The doors are 60 feet long. They are constructed of graphite/epoxy composite material. The left door weighs 2,375 pounds and the right door weighs 2,535 pounds. The right door is heavier because it carries the active centerline latch mechanisms. The closed PBD provide the aerodynamic fairing required for the midfuselage and complete the environmental envelope for the payload bay. The PBD react fuselage torsional loads, support their own flight and purge pressure loadings, and support the radiators.

There are 16 centerline latches, 8 aft bulkhead latches, and 8 forward bulkhead latches which hold the doors in the closed position. The latches are grouped in gangs of four. Each gang has its own pair of actuating motors, gearbox and drive mechanism.

The Payload Bay Doors Mechanical Subsystem consists of three parts. These are the Centerline Latch Mechanism, the Bulkhead Latch Mechanism, and the Door Drive. Reference Figure 11 and Figure 12.

6. The Payload Bay Radiator (PBR) Deploy Mechanism provides the capability to release, deploy, stow and latch the two forward port and starboard radiator panels on the Payload Bay Doors. The Deploy Mechanism consists of (1) a latch system and (2) a deployment system. The Latch and Deployment Mechanisms are located on the Payload Bay Doors while the Passive Latch Rollers and the Radiator Hinge Plates are on the radiator panels.

Each deployable radiator is secured to the PBD in the stowed position by six ganged latches. One latch PDU on each panel contains two 3-phase motors used to latch or release the six latches/panel simultaneously. PDU motor output drives, via torque shafts, three rotary actuators on each panel. As the torque shaft rotates, the rotary actuator arm is displaced 53 degrees. This rotational displacement drives two latch hooks, connected to the actuator arm by push rods, bellcranks and links, to the latch or release state.

The Radiator Deployment System consists of PDUs (one per side), torque shafts, rotary actuators (two per panel), deployment cranks and connecting links. Deployment PDUs, torque shafts and rotary actuators are basically the same as in the Latch System except for rotational displacement of the rotary actuator which is 92 degrees during deployment operations. This rotational displacement is applied to a deployment crank attached to the output arm of the Rotary Actuator, which drives the Radiator Panel to a deployed or stowed state. A deployment mechanism disconnect feature allows for manual disconnect of the Deployment Crank by EVA crewman in the event of a failed radiator. Reference Figure 13 through Figure 20.

7. The Personnel Hatches (PH) allow crew and service personnel ingress and egress capability to the Orbiter. There are three hatches, the Ingress/Egress Hatch, which allows access to the Orbiter, and two Airlock Hatches, which allow access to the airlock and payload bay. All three hatches are on the middeck and are of a similar design.

Each of the three hatches consist of the following hardware: Actuator, Hatch Crank, Latches, O-Rings, and Purge Ports. In addition to the above hardware the Entry Hatch has a 10 inch viewport. The crank will rotate 450 degrees clockwise and counterclockwise. When the crank is rotated the actuator opens and closes the latches. The Entry Hatch has 18 latches and the Airlock Hatches have 6. These latches pull the hatch flush with the bulkhead and the O-rings form an airtight seal (see figure 24). The Purge Ports equalize the pressure between the two sides of the hatch. This allows the hatch to be easily opened. Reference Figure 21 through Figure 24.

- 8. The Vent Door Mechanism (VDM) enables pressure control of unpressurized compartments during transient pressure periods and environmental control during static pressure periods. There are eighteen doors which the Door Mechanism actuates electromechanically. The doors provide pressure and environmental control for the Forward RCS, Forward Fuselage Plenum, Mid Fuselage, Payload Bay, Aft Fuselage, Vertical Fin, OMS Pods and Wheel Wells. The Door Mechanism consists of 24 independently powered three-phase AC motors, connected via a differential gearbox and torque shaft/slip clutch to bellcranks, linkages, rod assembly with bolts, nuts, washers, cotterpins, microswitch position indicators, etc. Reference Figure 25 through Figure 27.
- 9. The Startracker Door Mechanism (SDM) enables an aperature in the orbiter skin on orbit in the Y & Z axis and provides protection for the Startracker and compartment during ascent and entry. The two doors are actuated electro-mechanically. Each Door Mechanism consists of two independently powered three-phase AC motors connected via a differential gearbox/train, actuator output and limit switches to either the Y or Z door. Reference Figure 28 and Figure 29.

3.2 Interfaces and Locations

The MAS interfaces with many onboard Orbiter systems including the Active Thermal Control System (ATCS), Air Surface Controls used for guidance and control, Crew, Guidance and Navigation, Communication and Tracking, Data Processing System, Electrical Power Display & Control, Elevons, External Tank Umbilical Door, Guidance & Navigation, and Purge, Vent & Drain Doors.

The MAS hardware is located throughout the Orbiter and interfaces primarily with the structure, electrical power, display and controls. The Air Data Probe and Startracker Door are located forward of the crew cabin. Personnel Hatches provide ingress/egress to the crew cabin. Ku-Band Deployment Mechanism, Payload Bay Doors, and the Payload Bay Radiator Deployment Mechanism are located in the Payload Bay. Purge, Vent and Drain Doors are located on each side of the Orbiter. The Elevon Seal Panels are located on top of each wing. ET Umbilical Doors are on the bottom side of the Orbiter.

3.3 Hierarchy

Figure 2 illustrates the hierarchy of the MAS hardware and the corresponding subcomponents. Figures 3 through 23 comprise the detailed system representation.

STARTRACKER DOOR PERSONNEL MECHANISM MECHANISM **VENT DOOR** HATCHES MECHANICAL ACTUATION SYSTEM OVERVIEW PAYLOAD BAY MECHANICAL ACTUATION SYSTEM RADIATORS PAYLOAD BAY DOORS **ELEVON SEAL** KU – BAND DEPLOY AIR DATA PROBE UMBILICAL PANEL MAS SUBSYSTEM OVERVIEW Figure

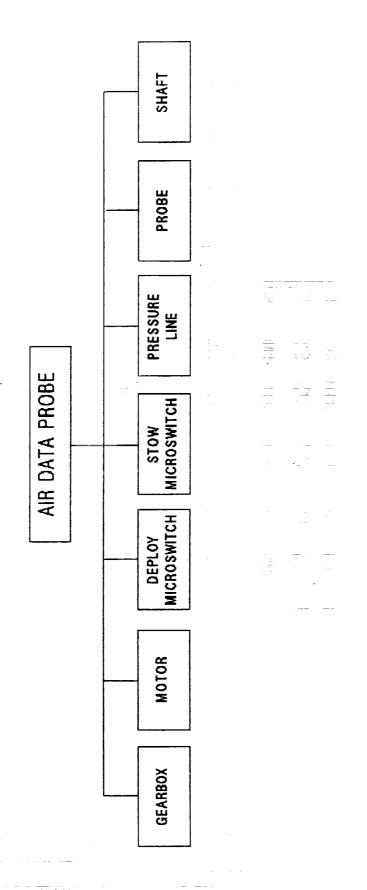


Figure 3 - AIR DATA PROBE FUNCTIONAL DIAGRAM

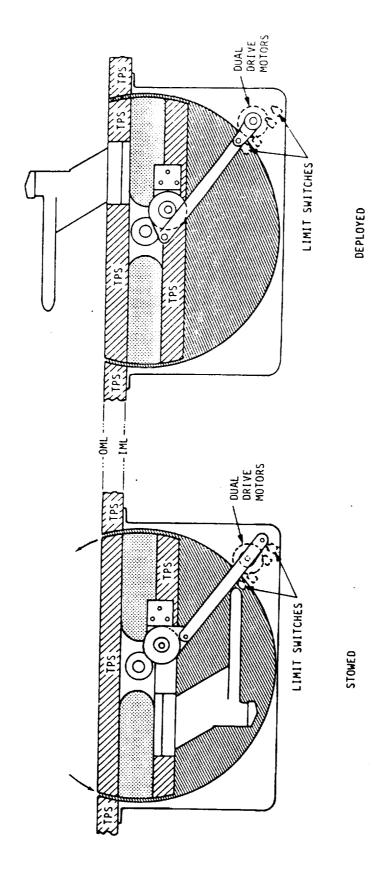


Figure 4 - AIR DATA PROBE

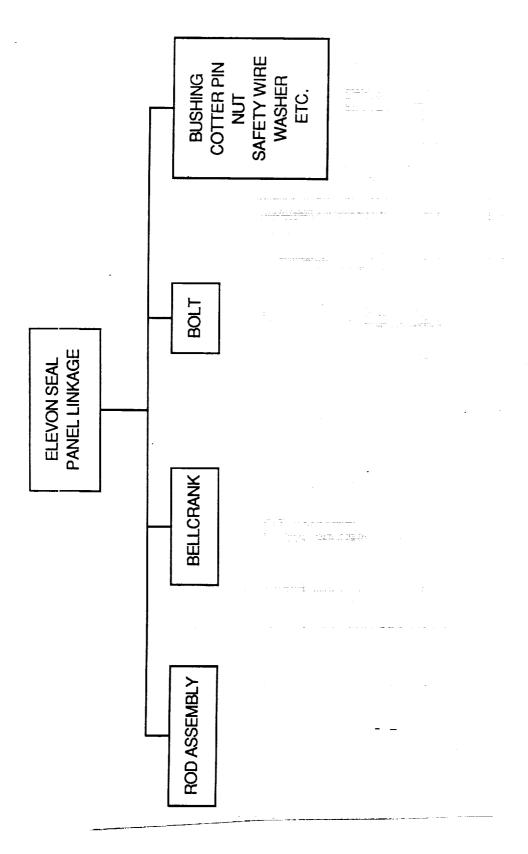


Figure 5 - ELEVON SEAL PANEL LINKAGE

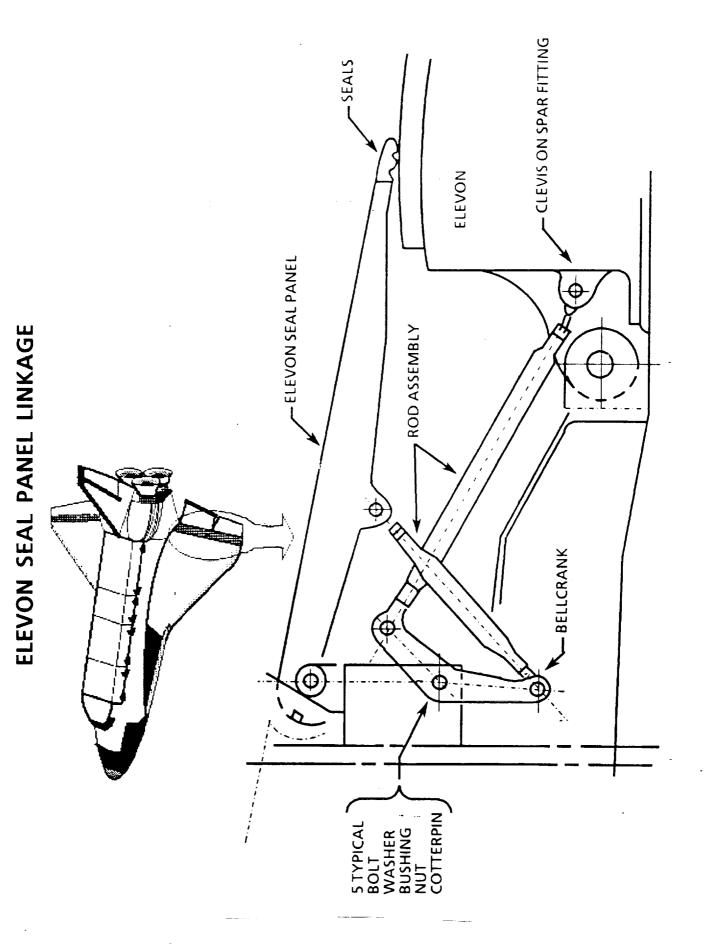


Figure 6 - ELEVON SEAL PANEL LINKAGE OVERVIEW

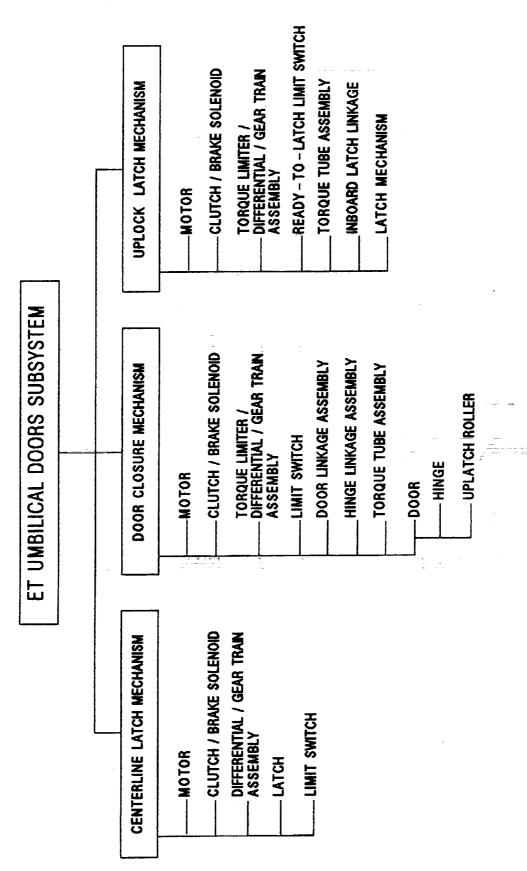


Figure 7 - ET UMBILICAL DOOR MECHANISM

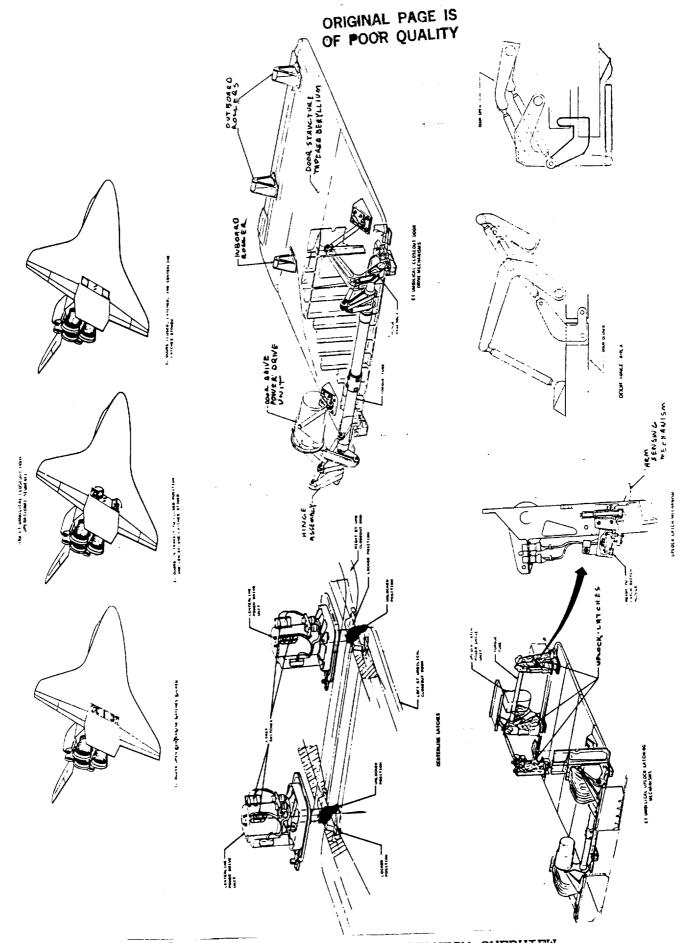


Figure 8 - ET UMBILICAL DOOR MECHANISM OVERVIEW

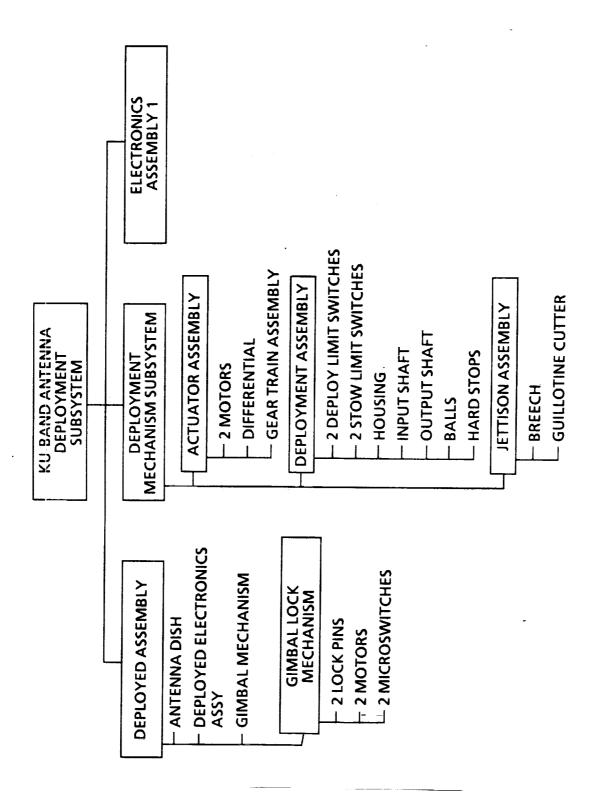


Figure 9 - Ku-BAND ANTENNA DEPLOYMENT SUBSYSTEM

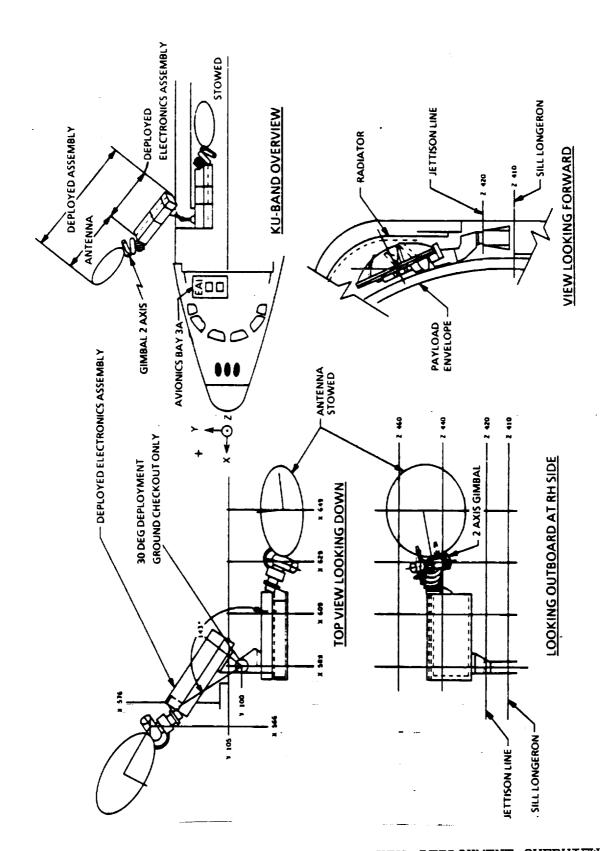


Figure 10 - Ku-BAND ANTENNA DEPLOYMENT OVERVIEW

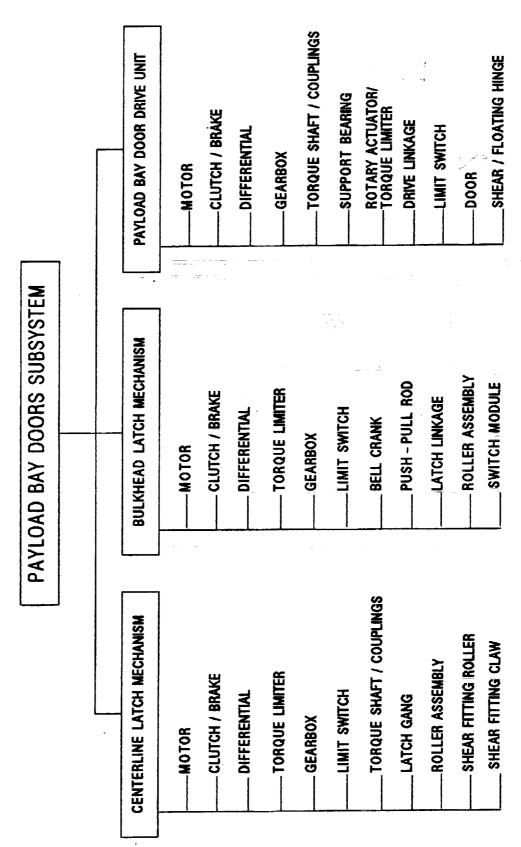
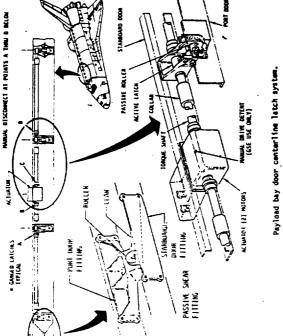


Figure 11 - PAYLOAD BAY DOOR MECHANISM

Payload tay door drive system

Bulkhead circular latch system (typical).



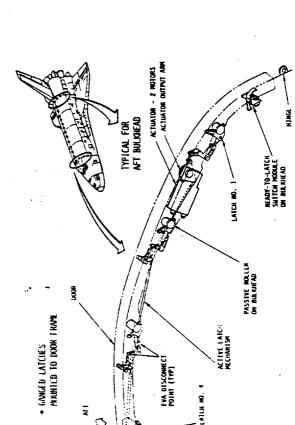


Figure 12 - PAYLOAD BAY DOOR MECHANISM OVERVIEW

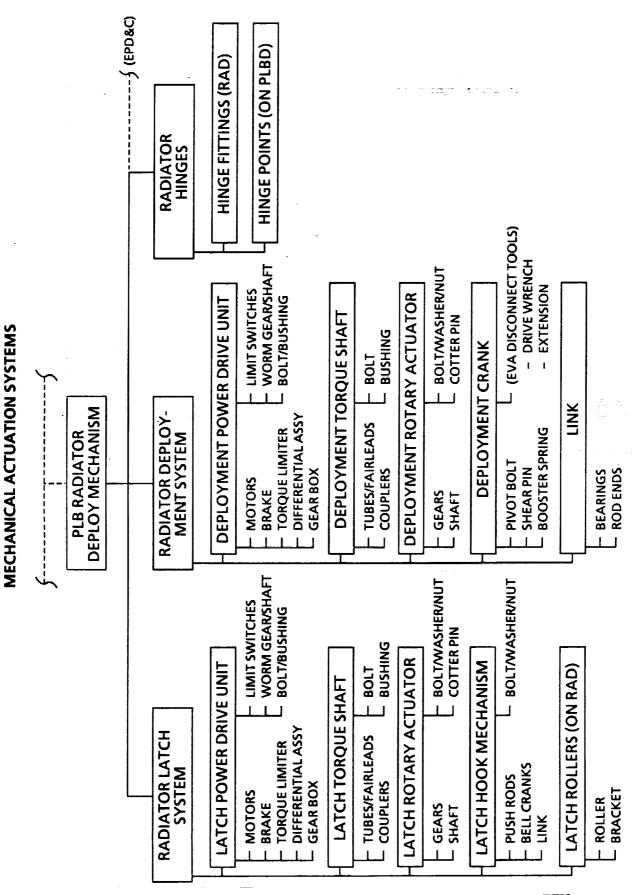


Figure 13 - PAYLOAD BAY RADIATOR DEPLOY SUBSYSTEM

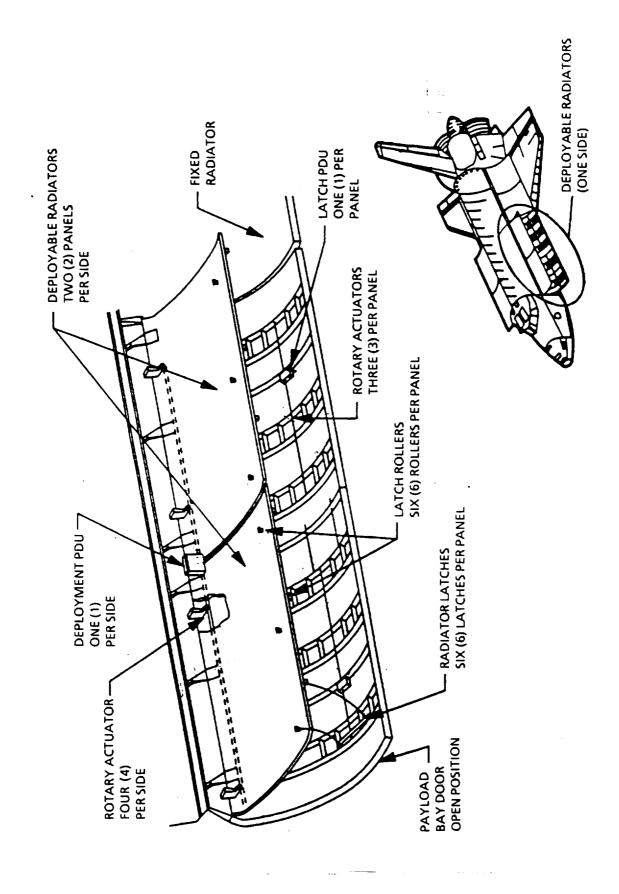


Figure 14 - RADIATOR DEPLOY SYSTEM

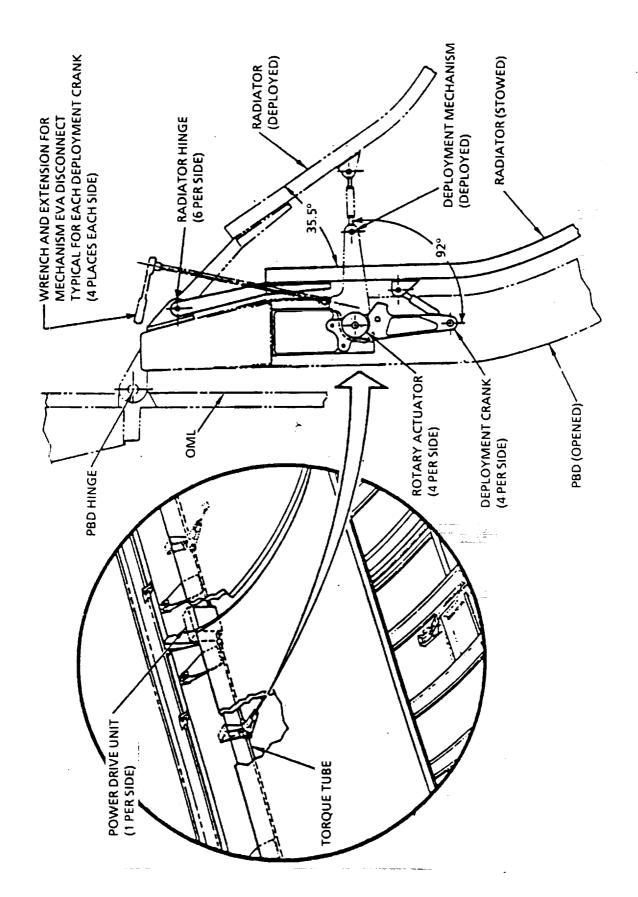


Figure 15 - RADIATOR DEPLOYMENT MECHANISM

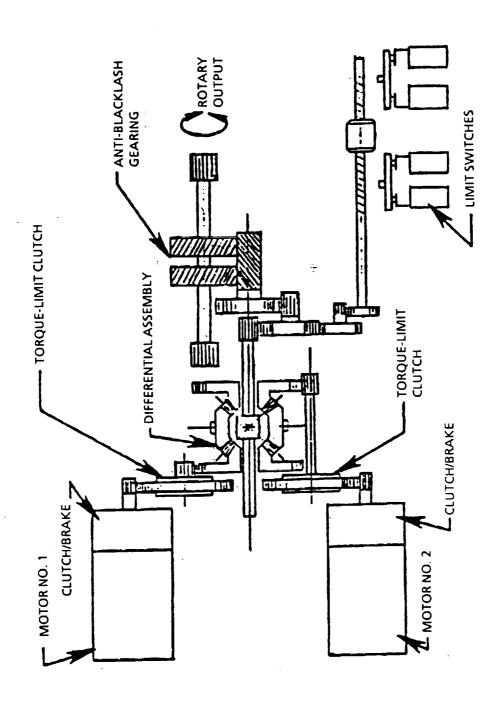


Figure 16 - POWER DRIVE UNIT (TYPICAL)

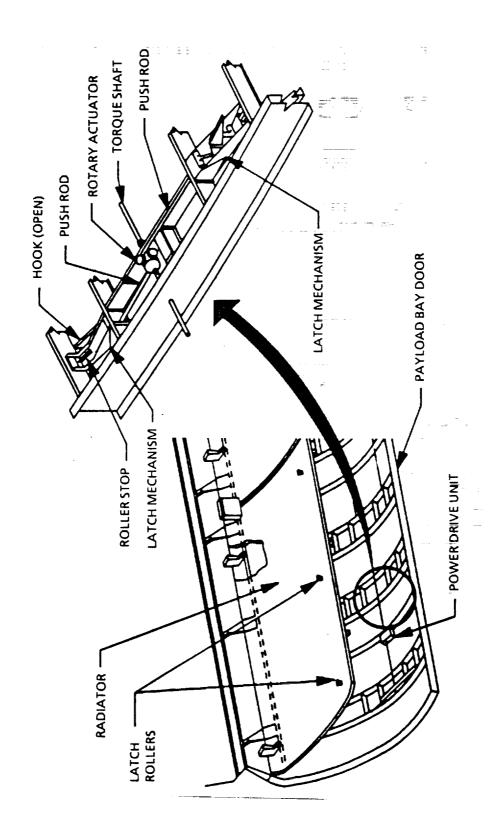


Figure 17 - RADIATOR LATCH SYSTEM

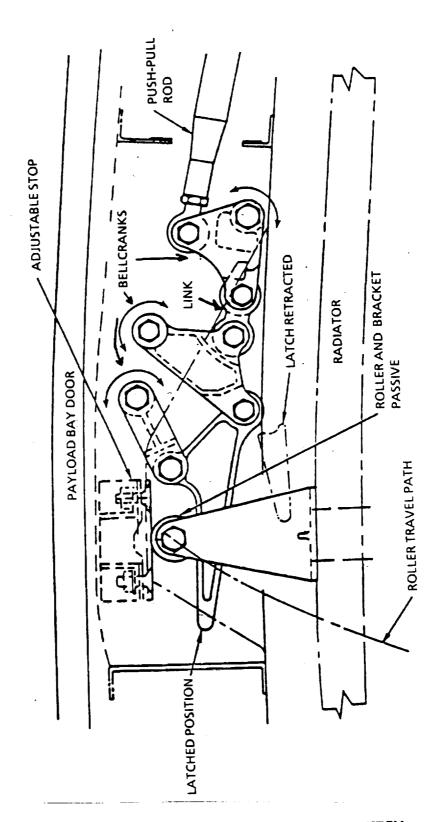


Figure 18 - RADIATOR LATCH HOOK MECHANISM

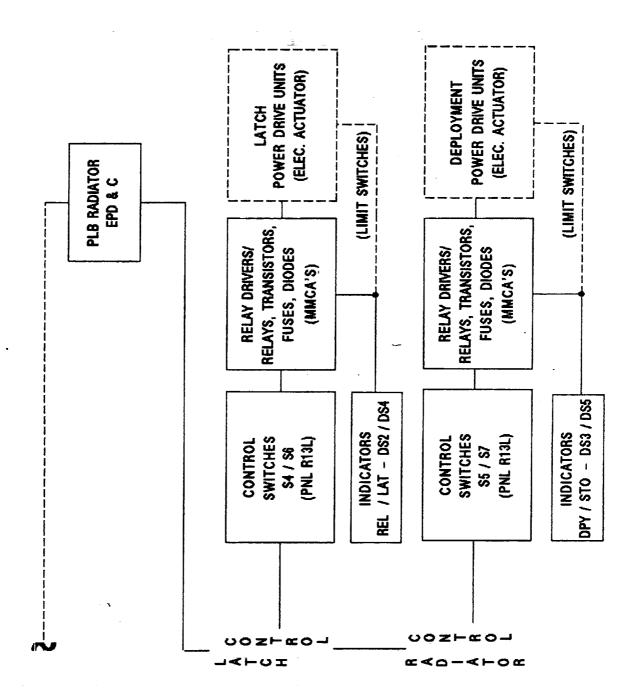
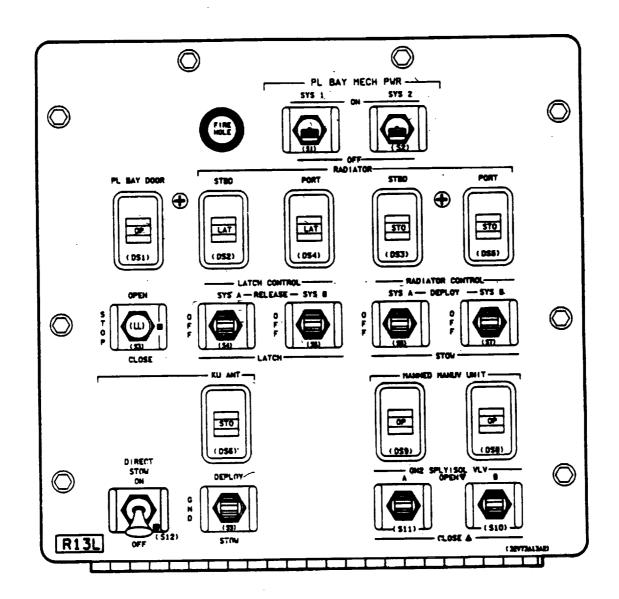


Figure 19 - PLB RADIATOR EPD&C



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Figure 20 - PLB RADIATOR PANEL

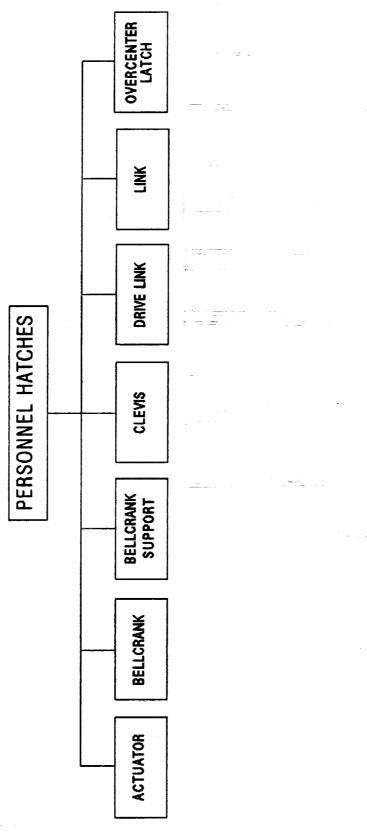


Figure 21 - PERSONNEL HATCH FUNCTIONAL DIAGRAM

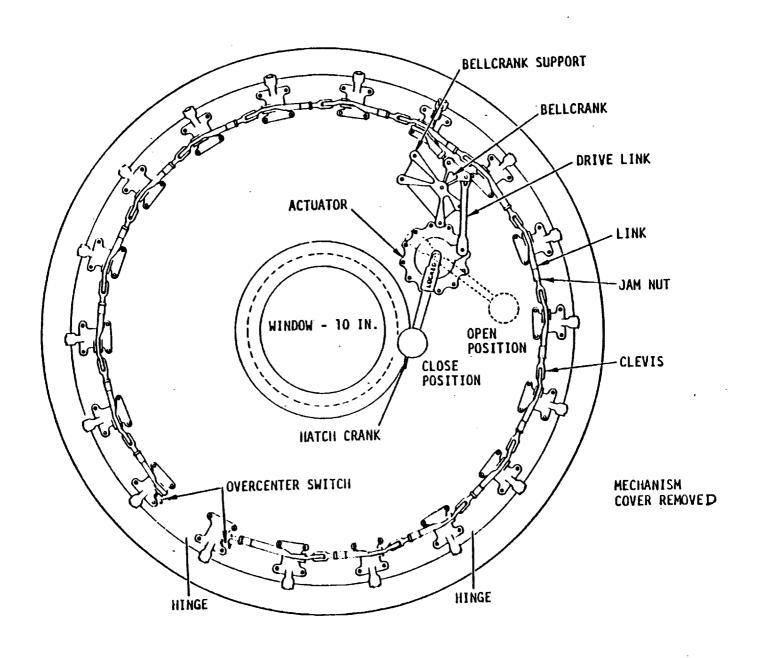


Figure 22 - INGRESS/EGRESS HATCH

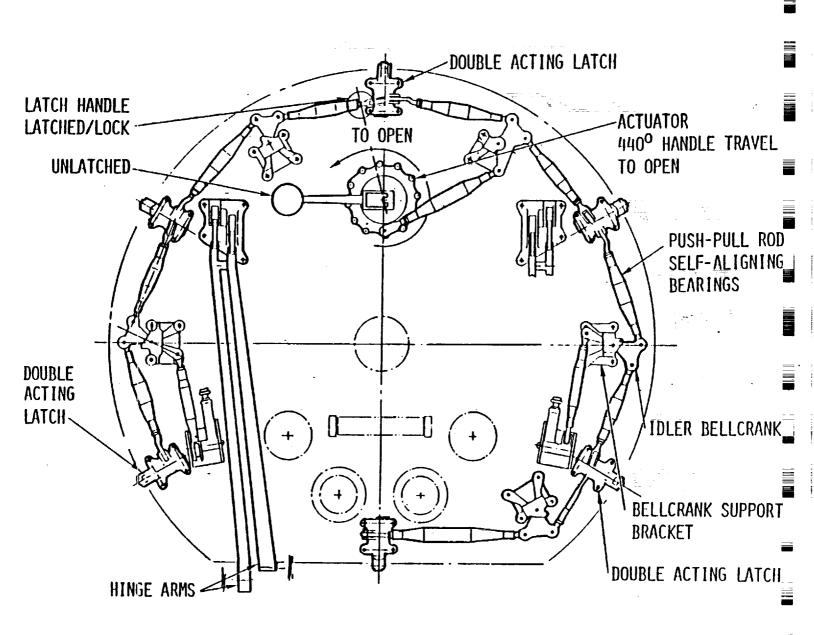


Figure 23 - AIRLOCK HATCH

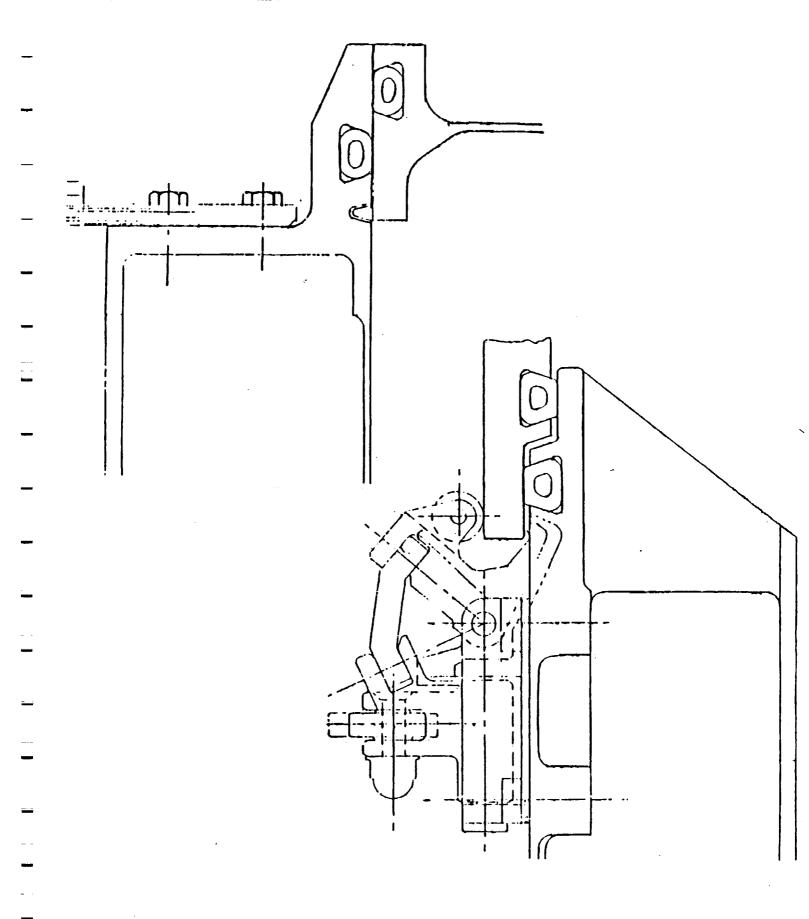


Figure 24 - HATCH SEALS

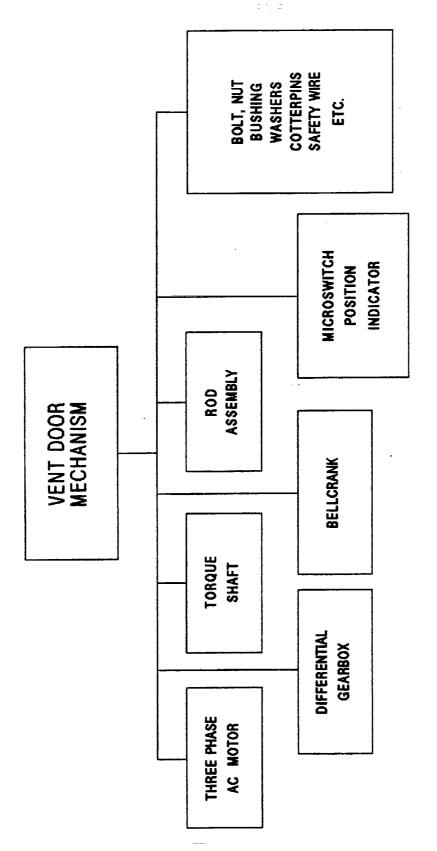
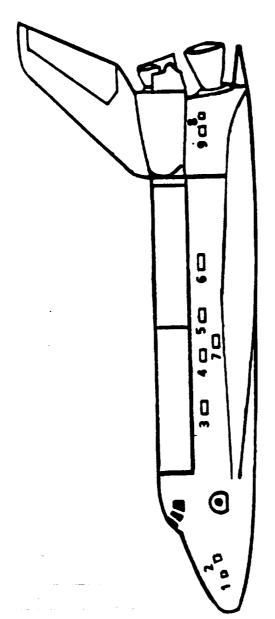


Figure 25 - VENT DOOR MECHANISM

ORBITER VENT DOOR MECHANISM LOCATION



VENT		2 N	C/L VENT LOCATIONS	ONS
NO.	COMPARTMENT VENTED	×	±Υο	Zo
_	FWD RCS	383.05	75.27	371.01
7	FWD FUSELAGE PLENUM	399.13	79.24	374.58
E		765.12	105	385.43
4	MID FUSELAGE	904.70	105	385.43
<u></u>	(CARGO BAY AND LOWER MID-	995.50	105	385.43
9	FUSELAGE	1127.84	105	385.43
`_	WING	934.12	105	356.19
	OMS POD (DEDICATED)	1429.29	116.49	335.50
6	AFT FUSELAGE	1389.63	112.70	357.82

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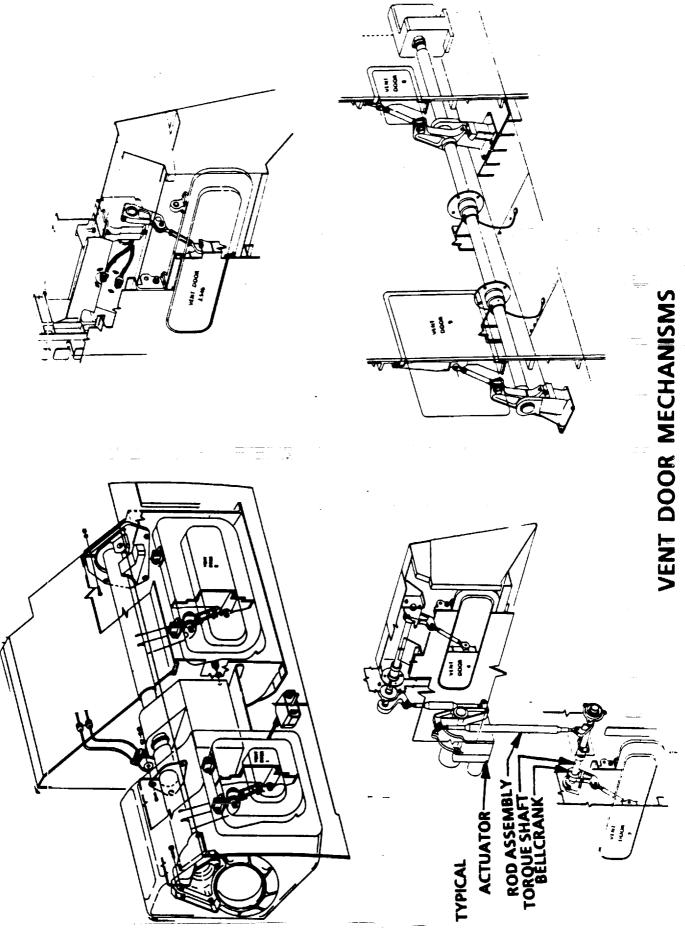


Figure 27 - VENT DOOR MECHANISM OVERVIEW

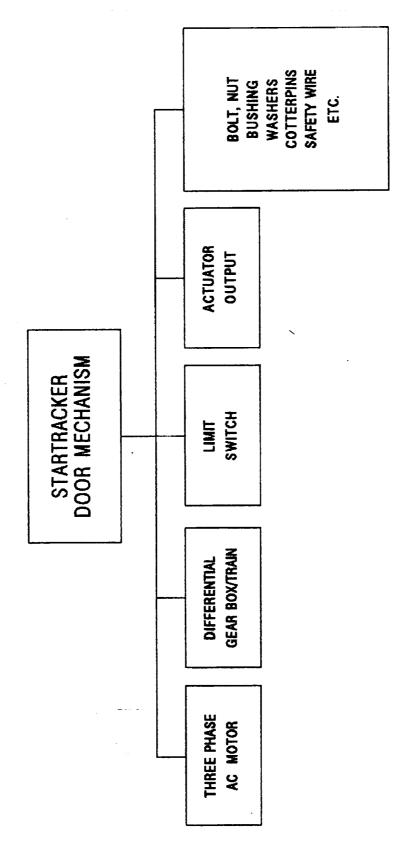


Figure 28 - STARTRACKER DOOR MECHANISM

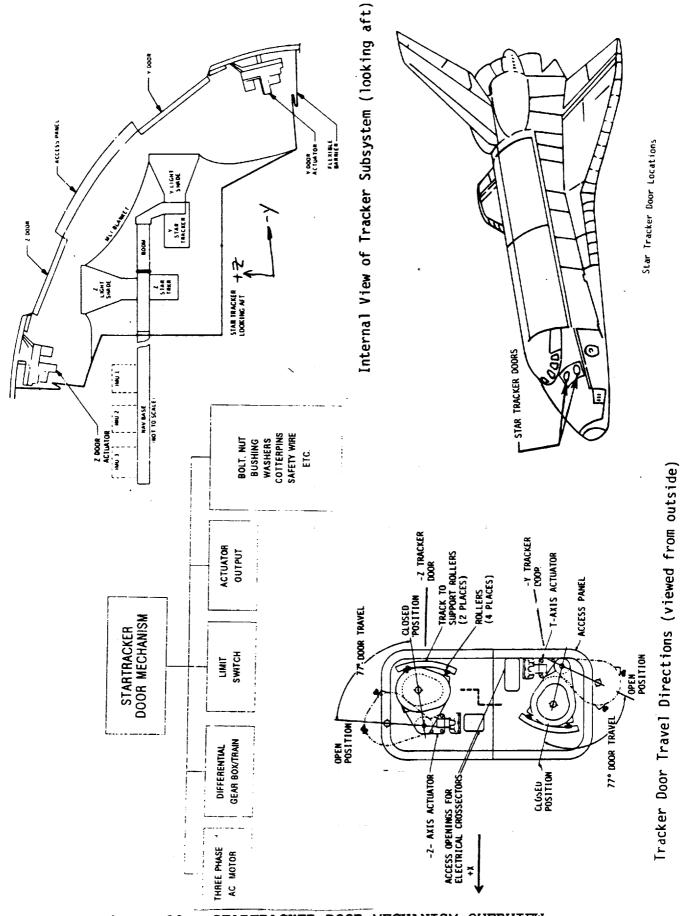


Figure 29 - STARTRACKER DOOR MECHANISM OVERVIEW

4.0 ANALYSIS RESULTS

Detailed analysis results for each of the identified failure modes are presented in Appendix C. Table I presents a summary of the failure criticalities for each of the nine major subdivisions of the MAS. Further discussion of each of these subdivisions and the applicable failure modes is provided in subsequent paragraphs.

Criticality	:	1/1	2/1R	2/2	3/1R	3/2R	3/3	TOTAL
ADP	:	0	0	0	143	0	69	212
ESP	:	6	0	0	0	0	1	7
ETU	:	23	30	0	0	0	20	73
KBD	:	3	6	1	111	42	37	200
PBD	:	25	45	2	4	2	20	98
PLR	:	0	0	0	14	0	22	36
PH	:	1	0	0	12	3	5	21
VDM	:	0	26	0	0	0	1	27
SDM	:	0	0	0	6	0	5	11
TOTAL	:	 58	107	3	290	47	180	685

Of the 685 failure modes analyzed, 58 failures were determined to result in loss of crew or vehicle, and 110 were determined to result in loss of mission. A summary of the Potential Critical Items is presented in Table II. Appendix D presents a cross-reference between each Potential Critical Item (PCI) and a specific worksheet in Appendix C.

Criticali	ty:	1/1	2/1R	2/2	3/1R	3/2R	TOTAL
	-	_	_	_		_	
ADP	:	0	0	0	143	0	143
ESP	;	6	0	0	0	0	6
ETU	:	23	30	0	0	0	53
KBD	:	3	6	1	110	42	162
PBD	:	25	45	2	o	0	72
PLR	:	0	lol	0	0	0	0
PH	:	1	o	0	10	3	14
VDM	:	0	26	0	0	0	26
SDM	:	0	lol	0	lol	0	0

The scheme for assigning IOA analysis (Appendix C) worksheet numbers is shown in Table III.

TABLE III IOA Worksheet Numbers							
Component	IOA ID Number MECH	EPD&C					
ADP	MAS-1101 to MAS-1112	MAS-1500 to MAS-1699					
ESP	MAS-2100 to MAS-2106	NA NA					
ETU	MAS-3101 to MAS-3144	MAS-3501 to MAS-3529					
KBD	MAS-4101 to MAS-4113	MAS-4500 to MAS-4687					
PBD	MAS-5101 to MAS-5179	MAS-5501 to MAS-5519					
PBR	MAS-6101 to MAS-6302	MAS-6501 to MAS-6510					
PH	MAS-7100 to MAS-7120	NA					
VDM	MAS-8100 to MAS-8109	MAS-8501 to MAS-8517					
SDM	MAS-9100 to MAS-9108	MAS-9500 to MAS-9501					

4.1 Analysis Results - Air Data Probe

The ADP analysis examined the components required to deploy the Orbiter Air Data Probes. The analysis identified 11 failure modes and 212 worksheets were generated. The analysis results identified 143 PCIs and these are listed in Appendix D.

4.2 Analysis Results - Elevon Seal Panel

The ESP analysis examined the components of the 34 outboard and inboard ESP linkage mechanisms. The analysis identified 7 failure modes and 7 worksheets were generated. The analysis results identified 6 PCIs and these are listed in Appendix D.

4.3 Analysis Results - External Tank Umbilical

The ETU analysis examined the components required to protect the Orbiter ET Umbilical Cavities from entry heating. The analysis identified 23 failure modes and 73 worksheets were generated. The analysis results identified 53 PCIs and these are listed in Appendix D.

4.4 Analysis Results - Ku Band Deploy

The KBD analysis examined the components required to deploy/ stow the Ku-Band Antenna. The analysis identified potential failure modes and 200 worksheets were generated. The analysis results identified 162 PCIs and these are listed in Appendix D.

4.5 Analysis Results - Payload Bay Doors

The PBD analysis examined the components used to open and close the Payload Bay Doors. The analysis identified 27 failure modes and 98 worksheets were generated. The analysis results identified 72 PCIs and these are listed in Appendix D.

4.6 Analysis Results - Payload Bay Radiators

The PBR analysis examined the components involved in latching and releasing, and deploying and stowing the Payload Bay Radiators. The analysis identified 18 failure modes and 36 worksheets were generated. The analysis results identified no PCIs.

4.7 Analysis Results - Personnel Hatches

The PH analysis examined the possible failures in the components used to open and close the personnel hatches. The analysis identified 8 failure modes and 21 worksheets were generated. There were 14 PCIs identified and these are listed in Appendix D.

4.8 Analysis Results - Vent Door Mechanism

The VDM analysis examined the components involved in opening /closing the Active Vent Doors and providing purge control via these vent ports. The analysis identified 10 potential failure modes and 27 worksheets were generated. The analysis results identified 26 PCIs and these are listed in Appendix D.

4.9 Analysis Results - Startracker Door

The SDM analysis examined the components required to open/close the Startracker Doors. The analysis identified potential failure modes and 11 worksheets were generated. The analysis results identified no PCIs.

5.0 REFERENCES

Reference documentation available from NASA and Rockwell was used in the analysis. The documentation used includes the following:

1.	JSC-18341	Mechanical Systems Console Handbook, Volume I, 3-1-85 & Volume II, 2-28-85.
2.	JSC-18863	Shuttle Operations, Guidance Navigation & Control, 9-30-85.
3.	JSC-08934	Shuttle Operational Data Book Rev. D, 10-1-84.
4.	VS70-971102	Integrated System Schematic Rev. D, 9-28-85.
5.	JSC-12770	Shuttle Flight Operations Manual, Volume 2, Electrical Power Systems, 11-28-84.
6.	JSC-12820	STS Operational Flight Rules, Final PCN-1, 4-16-87.
7.	JSC-11174	Space Shuttle System Handbook, Rev. C, DCN-5, 9-13-85.
8.	V72 Vol III	Operations and Maintenance Requirements and Specification Document - Orbiter OMRSD.
9.	VS70-973099	<pre>Integrated System Schematic, Rev. A10, 10-17-85.</pre>
10.	SD72-SH-0102-12	Requirements/Definition Document Rendezvous Radar Deployment Mechanisms Volume 2-12, 11-1-75.
11.	VS72-956099	Integrated System Schematic, Mechanical & Payload Systems, 2-11-85.
12.	NSTS 22206	Instructions for Preparation of Failure Modes and Effects Analysis (FMEA) and Critical Items List (CIL), change 2, PRCBD 40107D, 3-28-87.
13.	STRK/COAS 2102	Star Tracker/Crew Optical Alignment Sight Workbook, 9-30-83.
14.	VS70-590509	Schematic Diagram - Active Vent Door Subsystem, Rev-C, 1-17-85.

APPENDIX A

AC - Alternating Current ADP - Air Data Probe AOA - Abort Once Around - Active Thermal Control System ATCS ATO - Abort To Orbit BLKHD - Bulkhead - Critical Item CI CIL - Critical Items List - Center Line CLCRIT - Criticality DPS Data Processing System ESP - Elevon Seal Panel ET - External Tank ETU - External Tank Umbilical ETUD - ETU Door - Extravehicular Activity EVA - Functional F FM - Failure Mode **FMEA** - Failure Mode and Effects Analysis - Government Furnished Equipment GN&C - Guidance, Navigation and Control - Hardware HW IOA - Independent Orbiter Assessment KBD - Ku-Band Deploy LRU - Line Replaceable Unit MAS - Mechanical Actuation System MDAC - McDonnell Douglas Astronautics Company MTR - Motor NA - Not Applicable - National Aeronautics and Space Administration NASA - National Space Transportation System NSTS OMRSD - Operational Maintenance Requirements and Specifications Document OMS Orbital Maneuvering System PCI Potential Critical Item PDU - Power Drive Unit PH - Personnel Hatches PLB - Payload Bay PBD - Payload Bay Doors PBR - Payload Bay Radiator - Rockwell International RI RM - Redundancy Management RPC - Remote Power Controller RS Redundant Set

- Return To Landing Site

RTLS

- Startracker Door Mechanism SDM - Systems Management SM - Space Transportation System STS . - Switch SW - Transatlantic Abort Landing TAL TD - Touch Down - Translational Hand Controller THC - Torque Limit Clutch TLC - Volts Direct Current VDC - Vent Door Mechanism VDM

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APPENDIX B

DEFINITIONS, GROUND RULES, AND ASSUMPTIONS

- B.1 Definitions
 B.2 Project Level Ground Rules and Assumptions
 B.3 Subsystem-Specific Ground Rules and Assumptions

APPENDIX B DEFINITIONS, GROUND RULES, AND ASSUMPTIONS

B.1 Definitions

Definitions contained in NSTS 22206, Instructions For Preparation of FMEA/CIL, 10 October 1986, were used with the following amplifications and additions.

INTACT ABORT DEFINITIONS:

RTLS - begins at transition to OPS 6 and ends at transition to OPS 9, post-flight

TAL - begins at declaration of the abort and ends at transition to OPS 9, post-flight

AOA - begins at declaration of the abort and ends at transition to OPS 9, post-flight

ATO - begins at declaration of the abort and ends at transition to OPS 9, post-flight

<u>CREDIBLE (CAUSE)</u> - an event that can be predicted or expected in anticipated operational environmental conditions. Excludes an event where multiple failures must first occur to result in environmental extremes

<u>CONTINGENCY CREW PROCEDURES</u> - procedures that are utilized beyond the standard malfunction procedures, pocket checklists, and cue cards

<u>EARLY MISSION TERMINATION</u> - termination of on-orbit phase prior to planned end of mission

EFFECTS/RATIONALE - description of the case which generated the highest criticality

HIGHEST CRITICALITY - the highest functional criticality determined in the phase-by-phase analysis

MAJOR MODE (MM) - major sub-mode of software operational sequence
(OPS)

<u>MC</u> - Memory Configuration of Primary Avionics Software System (PASS)

MISSION - assigned performance of a specific Orbiter flight with payload/objective accomplishments including orbit phasing and altitude (excludes secondary payloads such as GAS cans, middeck P/L, etc.)

<u>MULTIPLE ORDER FAILURE</u> - describes the failure due to a single cause or event of all units which perform a necessary (critical) function

OFF-NOMINAL CREW PROCEDURES - procedures that are utilized beyond the standard malfunction procedures, pocket checklists, and cue cards

OPS - software operational sequence

PRIMARY MISSION OBJECTIVES - worst case primary mission objectives are equal to mission objectives

PHASE DEFINITIONS:

PRELAUNCH PHASE - begins at launch count-down Orbiter
power-up and ends at moding to OPS Major Mode 102 (liftoff)

<u>LIFTOFF MISSION PHASE</u> - begins at SRB ignition (MM 102) and ends at transition out of OPS 1 (Synonymous with ASCENT)

ONORBIT PHASE - begins at transition to OPS 2 or OPS 8 and ends at transition out of OPS 2 or OPS 8

DEORBIT PHASE - begins at transition to OPS Major Mode
301 and ends at first main landing gear touchdown

<u>LANDING/SAFING PHASE</u> - begins at first main gear touchdown and ends with the completion of post-landing safing operations

APPENDIX B DEFINITIONS, GROUND RULES, AND ASSUMPTIONS

B.2 IOA Project Level Ground Rules and Assumptions

The philosophy embodied in NSTS 22206. Instructions for Preparation of FMEA/CIL, 10 October 1986, was employed with the following amplifications and additions.

1. The operational flight software is an accurate implementation of the Flight System Software Requirements (FSSRs).

RATIONALE: Software verification is out-of-scope of this task.

2. After liftoff, any parameter which is monitored by system management (SM) or which drives any part of the Caution and Warning System (C&W) will support passage of Redundancy Screen B for its corresponding hardware item.

RATIONALE: Analysis of on-board parameter availability and/or the actual monitoring by the crew is beyond the scope of this task.

3. Any data employed with flight software is assumed to be functional for the specific vehicle and specific mission being flown.

RATIONALE: Mission data verification is out-of-scope of this task.

4. All hardware (including firmware) is manufactured and assembled to the design specifications/drawings.

RATIONALE: Acceptance and verification testing is designed to detect and identify problems before the item is approved for use.

5. All Flight Data File crew procedures will be assumed performed as written, and will not include human error in their performance.

RATIONALE: Failures caused by human operational error are out-of-scope of this task.

6. All hardware analyses will, as a minimum, be performed at the level of analysis existent within NASA/Prime Contractor Orbiter FMEA/CILs, and will be permitted to go to greater hardware detail levels but not lesser.

RATIONALE: Comparison of IOA analysis results with other analyses requires that both analyses be performed to a comparable level of detail.

7. Verification that a telemetry parameter is actually monitored during AOS by ground-based personnel is not required.

RATIONALE: Analysis of mission-dependent telemetry availability and/or the actual monitoring of applicable data by ground-based personnel is beyond the scope of this task.

8. The determination of criticalities per phase is based on the worst case effect of a failure for the phase being analyzed. The failure can occur in the phase being analyzed or in any previous phase, whichever produces the worst case effects for the phase of interest.

RATIONALE: Assigning phase criticalities ensures a thorough and complete analysis.

9. Analysis of wire harnesses, cables, and electrical connectors to determine if FMEAs are warranted will not be performed nor FMEAs assessed.

RATIONALE: Analysis was substantially complete prior to NSTS 22206 ground rule redirection.

10. Analysis of welds or brazed joints that cannot be inspected will not be performed nor FMEAs assessed.

RATIONALE: Analysis was substantially complete prior to NSTS 22206 ground rule redirection.

11. Emergency system or hardware will include burst discs and will exclude the EMU Secondary Oxygen Pack (SOP), pressure relief valves and the landing gear pyrotechnics.

RATIONALE: Clarify definition of emergency systems to ensure consistency throughout IOA project.

APPENDIX B DEFINITIONS, GROUND RULES, AND ASSUMPTIONS

B.3 MAS-Specific Ground Rules and Assumptions

The IOA analysis was performed to the component or assembly level of the Orbiter Mechanical Actuation System. The analysis considered the worst case effects of the hardware or functional failure on the subsystem, mission, and crew and vehicle safety.

APPENDIX C DETAILED ANALYSIS

This section contains the IOA analysis worksheets employed during the analysis of the Mechanical Actuation System. The information on these worksheets is intentionally similar to the FMEA's written by Rockwell and the NASA. Each of these sheets identifies the item being analyzed, and parent assembly, as well as the function. For each failure mode, the possible causes are outlined, and the assessed hardware and functional criticality for each mission phase is listed, as described in the Rockwell Desk Instructions 100-2G. Finally, effects are entered at the bottom of each sheet, and the worst case criticality is entered at the top.

LEGEND FOR IOA ANALYSIS WORKSHEETS

Hardware Criticalities:

- 1 = Loss of life or vehicle
- 2 = Loss of mission
- 3 = Non loss of life or vehicle or mission

Functional Criticalities:

- 1R = Redundant identical hardware components or redundant functional paths all of which, if failed, could cause loss of life or vehicle.
- 2R = Redundant identical hardware components or redundant functional paths all of which, if failed, could cause loss of mission.

Redundancy Screen A:

- 1 = Is Checked Out PreFlight
- 2 = Is Capable of Check Out PreFlight
- 3 = Not Capable of Check Out PreFlight
 - = Do Not Know

Redundancy Screens B and C:

- P = Passed Screen
- F = Failed Screen
- NA = Not Applicable

C.1

AIR DATA PROBE ANALYSIS WORKSHEETS

AIR DATA PROBE ANALYSIS WORKSHEETS SUMMARY

MDAC-ID	CRITIC FLIGHT H/F	ABORT		ITEM NAME
MDAC ID				
1101 +	3/1R	3/1R	PFP	MOTOR GEARBOX GEARBOX PRESSURE LINE
1102 *	3/1R	3/1R	PFP	GEARBOX
1103 *	3/1R	3/1R	PFP	GEARBOX
1104 *	3/1R	3/1R	PFP	PRESSURE LINE
1105 *	3/1R	3/1R	PFP	PROBE
1106 *	3/1R	3/1R	PFP	PROBE
1107 *	3/1R	3/1R	PFP	SHAFT
1101 * 1102 * 1103 * 1104 * 1105 * 1106 * 1107 * 1108 * 1109	3/1R	3/1R	PFP	SHAFT
1109 1110 1111	3/3	3/3		DEPLOY MICROSWITCH
1110	3/3	3/3		DEPLOY MICROSWITCH
1111	3/3	3/3		STOW MICROSWITCH
1112	3/3	3/3		STOW MICROSWITCH
1500 *	3/1R	3/1R	PFP	+28V CONTACT #1
1501 *	3/1R	3/1R	PFP	+28V CONTACT #1
1502 *	3/1R	3/1R	PFP	+28V CONTACT #2
1503 *	3/1R	3/1R	PFP	+28V CONTACT #2
1504 *	3/1R	3/1R	PFP	+28V CONTACT #3
1505 *	3/1R	3/1R	PFP	+28V CONTACT #3
1506 *	3/1R	3/1R	PFP	+28V CONTACT #4
1507 *	3/1R	3/1R	PFP	+28V CONTACT #1 +28V CONTACT #2 +28V CONTACT #2 +28V CONTACT #3 +28V CONTACT #3 +28V CONTACT #4 +28V CONTACT #4 +28V CONTACT #4
	3/3 3/1R	3/3	5 5 5	+28V CONTACT #1
1509 *	3/1R	3/1R	PFP	+28V CONTACT #1 +28V CONTACT #2
1510	3/3 3/1R 3/3	3/3	PFP	+28V CONTACT #2
1511 *	3/1K	3/1K	PFP	+28V CONTACT #2
1512	3/3 3/1R	3/3 2/10	PFP	+28V CONTACT #3
1513 * 1514	3/18	3/3	FIF	+28V CONTACT #4
1515 *	3/1P	3/1R	PFP	+28V CONTACT #4
1516 *	3/1R	3/1R	PFP	+28V CONTACT #1
1517	3/3	3/3		+28V CONTACT #1
	3/1R	3/1R	PFP	+28V CONTACT #2
1519	3/3	3/3		+28V CONTACT #2
		3/1R	PFP	+28V CONTACT #3
1521	2/2	2/2		+28V CONTACT #3
1522 *	3/1R	3/1R	P F P	+28V CONTACT #4
1523	3/3	3/3		+28V CONTACT #4
1524 *	3/1R	3/1R	PFP	+28V CONTACT #1
1525	3/3	3/3		+28V CONTACT #1
1526 *		3/1R	PFP	+28V CONTACT #2
1527	3/3	3/3		+28V CONTACT #2
1528	3/3	3/3		CONTACT #1
1529	3/3	3/3		CONTACT #1
1530	3/3	3/3		CONTACT #2
1531	3/3	3/3	D = D	CONTACT #2 +28V CONTACT #1
1532 *	3/1R	3/ IR	_ P F P	+28V CONTACT #1

^(*) Potential Critical Items.

	CRITIC	ALITY	REDUNDANCY		
	FLIGHT	ABORT	SCREENS		
MDAC:-ID	H/F	H/F	A B C		ITEM NAME
1533 *	3/1R	3/1R	PFP	+28V CONTACT	#1
1534 *	3/1R	3/1R	PFP	+28V CONTACT	#2
1535 *	3/1R	3/1R	PFP	+28V CONTACT	#2
1536 *	3/1R	3/1R		+28V CONTACT	#3
1537 *	3/1R	3/1R	PFP	+28V CONTACT	#3,,,,,
1538 *	3/1R	3/1R	PFP	+28V CONTACT	#4
1539 *	3/1R	3/1R	PFP	+28V CONTACT	#4
1540	3/3	3/3	and the second second	+28V CONTACT	#1
1541. *	3/1R	3/1R	PFP		#1 "
1542	3/3	3/3			#2
1543 *	3/1R	3/1R	P F P	The state of the s	#2
1544	3/3	3/3			#3.
1545 *	3/1R	3/1R	PFP		#3
1546	3/3	3/3			# 4
1547 *	3/1R	3/1R	PFP	The same of the sa	#4
1548 *	3/1R	3/1R	PFP		#1
1549	3/3	3/3			<u>#</u> 1
1550 *	3/1R	3/1R	PFP		#2
1551.	3/3	3/3			#2
1552 *	3/1R	3/1R	PFP		#3
1553	3/3	3/3_	<u>.</u>		#3
1554 *	3/1R	3/1R	PFP	A	#4
1555	3/3	3/3			#4
1556 *	3/1R	3/1R	PFP		#1
1557	3/3	3/3	dir	And the second s	#1
1558 *	3/1R	3/1R	PFP		#2
1559	3/3	3/3			#2
1560	3/3	3/3		CONTACT #1	
1561.	3/3	3/3		CONTACT #1	
1562	3/3	3/3		CONTACT #2	
1563	3/3	3/3	D B D	CONTACT #2 INVERTED AND (7 A M E
1564 *	3/1R	3/1R	P F P P F P	INVERTED AND	
1565 *	3/1R	3/1R 3/1R	PFP	INVERTED AND	
1566 *	3/1R		PFP	INVERTED AND	
1567 * 1568 *	3/1R 3/1R	3/1R 3/1R		INVERTED AND	
1568 W	3/3	3/3		INVERTED AND	
1570 *	3/1R	3/1R	PFP	INVERTED AND	
1570 -	3/3	3/3		INVERTED AND	
1572 *	3/1R	3/1R	PFP	RELAY DRIVER	
1573 *	3/1R	3/1R		RELAY DRIVER	
1574 *	3/1R	3/1R		RELAY DRIVER	
1575 *	3/1R	3/1R		RELAY DRIVER	
1576 *	3/1R	3/1R		RELAY DRIVER	
1577	3/3	3/3	• • • .	RELAY DRIVER	
10 / i	3/3	3/3			

^(*) Potential Critical Items.

WD3.C-TD	FLIGHT	ALITY ABORT H/F		ITEM NAME
MDAC-ID	n/ r 	n/ r 	7 D C	**************************************
1578 *	3/1R	3/1R	PFP	RELAY DRIVER
1579	3/3	2/2		RELAY DRIVER
1580 *	3/1R	3/1R	PFP	RELAY
1581 *	3/1R	3/1R	PFP	RELAY
1582 *	3/1R	3/1R	P F P P F P	RELAY
1583 *	3/1R	3/1R	PFP	RELAY
1584 *	3/1R	3/1R	PFP	RELAY
1585	3/3	3/3		RELAY
1586 *	3/1R	3/1R	PFP	RELAY
1587	3/3	3/3		RELAY
1588	3/3	3/3		AND GATE
1589 *	3/1R		PFP	AND GATE
1590	3/3	3/3		TIME DELAY
1591 *	3/1R	3/1R	PFP	TIME DELAY
1592	3/3	3/3		SOLID STATE DRIVER
1593 *	3/1R		PFP	SOLID STATE DRIVER
1594	3/3	3/3		REMOTE POWER CONTROLLER
1595 *	3/1R	3/1R	PFP	REMOTE POWER CONTROLLER REMOTE POWER CONTROLLER
1596	3/3			REMOTE POWER CONTROLLER
1597 *	3/1R	3/1R	PFP	REMOTE POWER CONTROLLER
1598	3/3	3/3	PFP	REMOTE POWER CONTROLLER
1599 *	3/1R	3/1R	PFP	SWITCH RELAY
1600	3/3	3/3 3/1P	PFP	SWITCH RELAY
1601 *	3/1R 3/3	3/18	FFF	LATCH RELAY
1602 1603 *	3/3 3/1R	3/10	PFP	LATCH RELAY
1604	3/18	3/3	.	EMI FILTER
1605 *	3/1R	3/1R	PFP	EMI FILTER
1606	3/3	3/3		OP AMP
1607 *	3/1R	3/1R	PFP	OP AMP
1608	3/3	3/3		REGULATOR
1609 *	3/1R	3/1R	PFP	REGULATOR
1610 *	3/1R	3/1R	PFP	GENERATOR
1611 *	3/1R	3/1R	PFP	GENERATOR
1612 *	3/1R	3/1R	PFP	CLOCK
1613 *	3/1R	3/1R	PFP	CLOCK
1614	3/3	3/3		+Q TRANSISTOR
1615 *		3/1R	PFP	+Q TRANSISTOR
1616		3/3		-Q TRANSISTOR
1617 *	3/1R	3/1R	PFP	-Q TRANSISTOR
1618	3/3	3/3		TRANSFORMER
1619 *	3/1R		PFP	TRANSFORMER
1620	3/3	3/3		+10V AMP
1621 *	3/1R		PFP	+10V AMP
1622	3/3	3/3		-10V AMP

^(*) Potential Critical Items.

MDAC-ID		CRITIC				ANCY		
1623 * 3/1R 3/1R P F P -10V AMP 1624 3/3 3/3 +10V TRANSISTOR 1625 * 3/1R 3/1R P F P +10V TRANSISTOR 1626 3/3 3/3 -10V TRANSISTOR 1627 * 3/1R 3/1R P F P -10V TRANSISTOR 1628 3/3 3/3 POWER SUPPLY TEST AMP 1629 * 3/1R 3/1R P F P POWER SUPPLY TEST AMP 1630 3/3 3/3 AMP 1631 3/3 3/3 AMP 1631 3/3 3/3 AMP 1632 3/3 3/3 AMP 1633 3/3 3/3 AMP 1633 3/3 3/3 THERMISTER THERMOMETER 1636 3/3 3/3 THERMISTER THERMOMETER 1636 3/3 3/3 THERMISTER THERMOMETER 1637 * 3/1R 3/1R P F P FIELD EFFECT TRANSISTOR 1638 3/3 3/3 THERMISTER THERMOMETER 1639 * 3/1R 3/1R P F P READ ONLY MEMORY 1641 * 3/1R 3/1R P F P READ ONLY MEMORY 1641 * 3/1R 3/1R P F P READ ONLY MEMORY 1642 3/3 3/3 TRANSDUCER TEMP AMP 1644 3/3 3/3 AMP 1645 * 3/1R 3/1R P F P AMP 1646 3/3 3/3 TRANSDUCER TEMP AMP 1647 * 3/1R 3/1R P F P TRANSISTOR 1648 * 3/1R 3/1R P F P AND GATE 1649 * 3/1R 3/1R P F P BINARY COUNTER 1650 * 3/1R 3/1R P F P BINARY COUNTER 1651 * 3/1R 3/1R P F P BINARY COUNTER 1652 * 3/1R 3/1R P F P BINARY COUNTER 1655 * 3/1R 3/1R P F P ADDRESSABLE SWITCH 1656 * 3/1R 3/1R P F P ADDRESSABLE SWITCH 1657 * 3/1R 3/1R P F P ADDRESSABLE SWITCH 1658 * 3/1R 3/1R P F P ADDRESSABLE SWITCH 1659 * 3/1R 3/1R P F P BINARY COUNTER 1659 * 3/1R 3/1R P F P DADRESSABLE SWITCH 1650 * 3/1R 3/1R P F P ADDRESSABLE SWITCH 1651 * 3/1R 3/1R P F P ADDRESSABLE SWITCH 1652 * 3/1R 3/1R P F P ADDRESSABLE SWITCH 1655 * 3/1R 3/1R P F P DADRESSABLE SWITCH 1656 * 3/1R 3/1R P F P ADDRESSABLE SWITCH 1657 * 3/1R 3/1R P F P DADRESSABLE SWITCH 1658 * 3/1R 3/1R P F P DADRESSABLE SWITCH 1659 * 3/1R 3/1R P F P DADRESSABLE SWITCH 1660 * 3/1R 3/1R P F P DADRESSABLE SWITCH 1661 * 3/1R 3/1R P F P CONTROL LOGIC 1662 * 3/1R 3/1R P F P CONTROL LOGIC 1663 * 3/1R 3/1R P F P CONTROL LOGIC 1664 * 3/1R 3/1R P F P DADRESSABLE SWITCH 1665 * 3/1R 3/1R P F P DADRESSABLE SWITCH 1666 * 3/1R 3/1R P F P DADRESSABLE SWITCH 1666 * 3/1R 3/1R P F P DADRESSABLE SWITCH 1666 * 3/1R 3/1R P F P DADRESSABLE SWITCH 1666 * 3/1R 3/1R P F P DADRESSABLE SWITCH 1666 * 3/1R 3/1R P F P DADRESSABLE SWITCH 1666 * 3/1R 3/1R P F P DADRESSABLE SWITCH 1		FLIGHT	ABORT					
1624 3/3 3/3 +10V TRANSISTOR 1625 * 3/1R 3/1R P F P +10V TRANSISTOR 1626 3/3 3/3 -10V TRANSISTOR 1627 * 3/1R 3/1R P F P -10V TRANSISTOR 1628 3/3 3/3 -10V TRANSISTOR 1629 * 3/1R 3/1R P F P -10V TRANSISTOR 1630 3/3 3/3	MDAC-ID	H/F	H/F	A 	В 	C	ITEM NAME	_
1625 * 3/1R 3/1R P F P +10V TRANSISTOR 1626 3/3 3/3 -10V TRANSISTOR 1627 * 3/1R 3/1R P F P -10V TRANSISTOR 1628 3/3 3/3 POWER SUPPLY TEST AMP 1629 * 3/1R 3/1R P F P P POWER SUPPLY TEST AMP 1630 3/3 3/3 AMP 1631 3/3 3/3 AMP 1632 3/3 3/3 AMP 1633 3/3 3/3 AMP 1633 3/3 3/3 THERNISTER THERMOMETER 1635 3/3 3/3 THERNISTER THERMOMETER 1636 3/3 3/3 THERNISTER THERMOMETER 1637 * 3/1R 3/1R P F P FIELD EFFECT TRANSISTOR 1638 3/3 3/3 CONTROL CIRCUIT 1640 * 3/1R 3/1R P F P READ ONLY MEMORY 1641 * 3/1R 3/1R P F P READ ONLY MEMORY 1642 3/3 3/3 TRANSDUCER TEMP AMP 1644 3/3 3/3 TRANSDUCER TEMP AMP 1645 * 3/1R 3/1R P F P AMP 1646 * 3/3 3/3 TRANSDUCER TEMP AMP 1647 * 3/1R 3/1R P F P AMP 1648 * 3/1R 3/1R P F P AMP 1650 * 3/1R 3/1R P F P AND GATE 1650 * 3/1R 3/1R P F P BINARY COUNTER 1651 * 3/1R 3/1R P F P BINARY COUNTER 1652 * 3/1R 3/1R P F P AND GATE 1655 * 3/1R 3/1R P F P AMP 1656 * 3/1R 3/1R P F P AMP 1657 * 3/1R 3/1R P F P AMP 1658 * 3/1R 3/1R P F P AMP 1658 * 3/1R 3/1R P F P AMP 1659 * 3/1R 3/1R P F P AMP 1659 * 3/1R 3/1R P F P AMP 1659 * 3/1R 3/1R P F P AMP 1650 * 3/1R 3/1R P F P AMP 1651 * 3/1R 3/1R P F P AMP 1652 * 3/1R 3/1R P F P AMP 1653 * 3/1R 3/1R P F P AMP 1654 * 3/1R 3/1R P F P AMP 1655 * 3/1R 3/1R P F P AMP 1656 * 3/1R 3/1R P F P AMP 1657 * 3/1R 3/1R P F P AMP 1658 * 3/1R 3/1R P F P AMP 1658 * 3/1R 3/1R P F P AMP 1659 * 3/1R 3/1R P F P AMP 1660 * 3/1R 3/1R P F P AMP 1661 * 3/1R 3/1R P F P AMP 1662 * 3/1R 3/1R P F P AMP 1656 * 3/1R 3/1R P F P OLARITY DETECTOR 1661 * 3/1R 3/1R P F P OLARITY DETECTOR 1662 * 3/1R 3/1R P F P CONTROL LOGIC 1663 * 3/1R 3/1R P F P CONTROL LOGIC 1664 * 3/1R 3/1R P F P CONTROL LOGIC 1665 * 3/1R 3/1R P F P CONTROL LOGIC 1666 * 3/1R 3/1R P F P POLARITY DETECTOR 1666 * 3/1R 3/1R P F P POLARITY DETECTOR 1666 * 3/1R 3/1R P F P POLARITY DETECTOR 1666 * 3/1R 3/1R P F P POLARITY DETECTOR 1666 * 3/1R 3/1R P F P POLARITY DETECTOR 1666 * 3/1R 3/1R P F P POLARITY DETECTOR 1666 * 3/1R 3/1R P F P POLARITY DETECTOR 1666 * 3/1R 3/1R P F P POLARITY DETECTOR 1666 * 3/1R 3/1R P F P POLARITY DETECTOR 1666 * 3/1R	1623 *	3/1R	3/1R	P	F	P	-10V AMP	
1626	1624	3/3	3/3				+10V TRANSISTOR	
1627 * 3/1R 3/1R P F P -10V TRANSISTOR 1628 3/3 3/3 3/3 POWER SUPPLY TEST AMP 1630 3/3 3/3 AMP 1631 3/3 3/3 AMP 1631 3/3 3/3 AMP 1632 3/3 3/3 AMP 1633 3/3 3/3 AMP 1634 3/3 3/3 FIELD EFFECT TRANSISTOR 1636 3/3 3/3 FIELD EFFECT TRANSISTOR 1637 * 3/1R 3/1R P F P F F F F F F F F F F F F F F F F	1625 *	3/1R	3/1R	P	F	P	+10V TRANSISTOR	
1627 * 3/1R 3/1R P F P -10V TRANSISTOR 1628 3/3 3/3 POWER SUPPLY TEST AMP 1630 3/3 3/3 AMP 1631 3/3 3/3 AMP 1632 3/3 3/3 AMP 1633 3/3 3/3 AMP 1633 3/3 3/3 AMP 1634 3/3 3/3 FIELD EFFECT TRANSISTOR 1636 3/3 3/3 FIELD EFFECT TRANSISTOR 1637 * 3/1R 3/1R P F P FIELD EFFECT TRANSISTOR 1638 3/3 3/3 FIELD EFFECT TRANSISTOR 1639 * 3/1R 3/1R P F P READ ONLY MEMORY 1641 * 3/1R 3/1R P F P READ ONLY MEMORY 1641 * 3/1R 3/1R P F P READ ONLY MEMORY 1642 3/3 3/3 TRANSISTOR 1644 3/3 3/3 FRANDUCER TEMP AMP 1645 * 3/1R 3/1R P F P AMP 1646 3/3 3/3 TRANSISTOR 1647 * 3/1R 3/1R P F P AMP 1648 * 3/1R 3/1R P F P AMP 1650 * 3/1R 3/1R P F P AND GATE 1651 * 3/1R 3/1R P F P AND GATE 1652 * 3/1R 3/1R P F P SERIAL SHIFT REGISTER 1653 * 3/1R 3/1R P F P BINARY COUNTER 1655 * 3/1R 3/1R P F P BINARY COUNTER 1655 * 3/1R 3/1R P F P AMP 1656 * 3/1R 3/1R P F P BINARY COUNTER 1659 * 3/1R 3/1R P F P AMP 1658 * 3/1R 3/1R P F P AMP 1658 * 3/1R 3/1R P F P AMP 1659 * 3/1R 3/1R P F P AMP 1659 * 3/1R 3/1R P F P AMP 1650 * 3/1R 3/1R P F P SERIAL SHIFT REGISTER 1651 * 3/1R 3/1R P F P SERIAL SHIFT REGISTER 1652 * 3/1R 3/1R P F P SERIAL SHIFT REGISTER 1653 * 3/1R 3/1R P F P SERIAL SHIFT REGISTER 1654 * 3/1R 3/1R P F P SERIAL SHIFT REGISTER 1655 * 3/1R 3/1R P F P SERIAL SHIFT REGISTER 1656 * 3/1R 3/1R P F P SERIAL SHIFT REGISTER 1657 * 3/1R 3/1R P F P SERIAL SHIFT REGISTER 1658 * 3/1R 3/1R P F P SERIAL SHIFT REGISTER 1659 * 3/1R 3/1R P F P SERIAL SHIFT REGISTER 1650 * 3/1R 3/1R P F P SERIAL SHIFT REGISTER 1651 * 3/1R 3/1R P F P SERIAL SHIFT REGISTER 1652 * 3/1R 3/1R P F P SERIAL SHIFT REGISTER 1653 * 3/1R 3/1R P F P SERIAL SHIFT REGISTER 1654 * 3/1R 3/1R P F P SERIAL SHIFT REGISTER 1655 * 3/1R 3/1R P F P CONTROL LOGIC 1666 * 3/1R 3/1R P F P CONTROL LOGIC 1667 * 3/1R 3/1R P F P CONTROL LOGIC 1668 * 3/1R 3/1R P F P CONTROL LOGIC 1666 * 3/1R 3/1R P F P CONTROL LOGIC 1666 * 3/1R 3/1R P F P DISCREET INPUT BUFFER	1626	3/3	3/3				-10V TRANSISTOR	
1628	1627 *			P	F	P	-10V TRANSISTOR	
1629 * 3/1R 3/1R P F P POWER SUPPLY TEST AMP 1630 3/3 3/3 AMP 1632 3/3 3/3 AMP 1633 3/3 3/3 AMP 1634 3/3 3/3 THERMISTER THERMOMETER 1635 3/3 3/3 THERMISTER THERMOMETER 1636 3/3 3/3 THERMISTER THERMOMETER 1637 * 3/1R 3/1R P F P FIELD EFFECT TRANSISTOR 1638 3/3 3/3 CONTROL CIRCUIT 1640 * 3/1R 3/1R P F P READ ONLY MEMORY 1641 * 3/1R 3/1R P F P READ ONLY MEMORY 1642 3/3 3/3 TRANSDUCER TEMP AMP 1644 3/3 3/3 TRANSDUCER TEMP AMP 1645 * 3/1R 3/1R P F P AMP 1646 3/3 3/3 TRANSDUCER TEMP AMP 1647 * 3/1R 3/1R P F P AMP 1648 * 3/1R 3/1R P F P AND GATE 1649 * 3/1R 3/1R P F P AND GATE 1650 * 3/1R 3/1R P F P SERIAL SHIFT REGISTER 1651 * 3/1R 3/1R P F P SERIAL SHIFT REGISTER 1652 * 3/1R 3/1R P F P SERIAL SHIFT REGISTER 1655 * 3/1R 3/1R P F P BINARY COUNTER 1656 * 3/1R 3/1R P F P AMP 1657 * 3/1R 3/1R P F P SERIAL SHIFT REGISTER 1658 * 3/1R 3/1R P F P SERIAL SHIFT REGISTER 1657 * 3/1R 3/1R P F P SERIAL SHIFT REGISTER 1658 * 3/1R 3/1R P F P SERIAL SHIFT REGISTER 1657 * 3/1R 3/1R P F P SERIAL SHIFT REGISTER 1656 * 3/1R 3/1R P F P SERIAL SHIFT REGISTER 1657 * 3/1R 3/1R P F P SERIAL SHIFT REGISTER 1658 * 3/1R 3/1R P F P SERIAL SHIFT REGISTER 1656 * 3/1R 3/1R P F P SERIAL SHIFT REGISTER 1657 * 3/1R 3/1R P F P SERIAL SHIFT REGISTER 1658 * 3/1R 3/1R P F P SWITCHING LADDER 1659 * 3/1R 3/1R P F P SWITCHING LADDER 1660 * 3/1R 3/1R P F P SWITCHING LADDER 1661 * 3/1R 3/1R P F P POLARITY DETECTOR 1662 * 3/1R 3/1R P F P SWITCHING LADDER 1664 * 3/1R 3/1R P F P POLARITY DETECTOR 1665 * 3/1R 3/1R P F P POLARITY DETECTOR 1666 * 3/1R 3/1R P F P REGISTER	1628						POWER SUPPLY TEST AMP	
1631 3/3 3/3 3/3 AMP 1632 3/3 3/3 AMP 1634 3/3 3/3 AMP 1635 3/3 3/3 THERMISTER THERMOMETER 1636 3/3 3/3 THERMISTER THERMOMETER 1637 * 3/1R 3/1R P F P FIELD EFFECT TRANSISTOR 1638 3/3 3/3 CONTROL CIRCUIT 1640 * 3/1R 3/1R P F P READ ONLY MEMORY 1641 * 3/1R 3/1R P F P READ ONLY MEMORY 1641 * 3/1R 3/1R P F P READ ONLY MEMORY 1642 3/3 3/3 TRANSDUCER TEMP AMP 1644 3/3 3/3 TRANSDUCER TEMP AMP 1645 * 3/1R 3/1R P F P AMP 1646 3/3 3/3 TRANSISTOR 1647 * 3/1R 3/1R P F P AMP 1646 3/3 3/3 TRANSISTOR 1647 * 3/1R 3/1R P F P AMP 1650 * 3/1R 3/1R P F P AND GATE 1650 * 3/1R 3/1R P F P AND GATE 1650 * 3/1R 3/1R P F P SERIAL SHIFT REGISTER 1651 * 3/1R 3/1R P F P SERIAL SHIFT REGISTER 1652 * 3/1R 3/1R P F P BINARY COUNTER 1653 * 3/1R 3/1R P F P ADDRESSABLE SWITCH 1655 * 3/1R 3/1R P F P ADDRESSABLE SWITCH 1656 * 3/1R 3/1R P F P AMP 1657 * 3/1R 3/1R P F P SWITCHING LADDER 1659 * 3/1R 3/1R P F P SWITCHING LADDER 1660 * 3/1R 3/1R P F P SWITCHING LADDER 1660 * 3/1R 3/1R P F P OLARITY DETECTOR 1661 * 3/1R 3/1R P F P OLARITY DETECTOR 1662 * 3/1R 3/1R P F P OLARITY DETECTOR 1663 * 3/1R 3/1R P F P CONTROL LOGIC 1663 * 3/1R 3/1R P F P REGISTER 1666 * 3/1R 3/1R P F P REGISTER	1629 *			P	F	P	POWER SUPPLY TEST AMP	
1631 3/3 3/3 3/3 AMP 1632 3/3 3/3 AMP 1634 3/3 3/3 AMP 1635 3/3 3/3 THERMISTER THERMOMETER 1636 3/3 3/3 THERMISTER THERMOMETER 1637 * 3/1R 3/1R P F P FIELD EFFECT TRANSISTOR 1638 3/3 3/3 CONTROL CIRCUIT 1640 * 3/1R 3/1R P F P READ ONLY MEMORY 1641 * 3/1R 3/1R P F P READ ONLY MEMORY 1641 * 3/1R 3/1R P F P READ ONLY MEMORY 1642 3/3 3/3 TRANSDUCER TEMP AMP 1644 3/3 3/3 TRANSDUCER TEMP AMP 1645 * 3/1R 3/1R P F P AMP 1646 3/3 3/3 TRANSISTOR 1647 * 3/1R 3/1R P F P AMP 1646 3/3 3/3 TRANSISTOR 1647 * 3/1R 3/1R P F P AMP 1650 * 3/1R 3/1R P F P AND GATE 1650 * 3/1R 3/1R P F P AND GATE 1650 * 3/1R 3/1R P F P SERIAL SHIFT REGISTER 1651 * 3/1R 3/1R P F P SERIAL SHIFT REGISTER 1652 * 3/1R 3/1R P F P BINARY COUNTER 1653 * 3/1R 3/1R P F P ADDRESSABLE SWITCH 1655 * 3/1R 3/1R P F P ADDRESSABLE SWITCH 1656 * 3/1R 3/1R P F P AMP 1657 * 3/1R 3/1R P F P SWITCHING LADDER 1659 * 3/1R 3/1R P F P SWITCHING LADDER 1660 * 3/1R 3/1R P F P SWITCHING LADDER 1660 * 3/1R 3/1R P F P OLARITY DETECTOR 1661 * 3/1R 3/1R P F P OLARITY DETECTOR 1662 * 3/1R 3/1R P F P OLARITY DETECTOR 1663 * 3/1R 3/1R P F P CONTROL LOGIC 1663 * 3/1R 3/1R P F P REGISTER 1666 * 3/1R 3/1R P F P REGISTER	1630	3/3	3/3				AMP	
1632	1631						AMP	
1634 3/3 3/3 THERMISTER THERMOMETER 1635 3/3 3/3 THERMISTER THERMOMETER 1636 3/3 3/3 FIELD EFFECT TRANSISTOR 1637 * 3/1R 3/1R P F P FIELD EFFECT TRANSISTOR 1638 3/3 3/3 CONTROL CIRCUIT 1640 * 3/1R 3/1R P F P CONTROL CIRCUIT 1640 * 3/1R 3/1R P F P READ ONLY MEMORY 1641 * 3/1R 3/1R P F P READ ONLY MEMORY 1642 3/3 3/3 TRANSDUCER TEMP AMP 1644 3/3 3/3 TRANSDUCER TEMP AMP 1645 * 3/1R 3/1R P F P AMP 1646 3/3 3/3 TRANSISTOR 1647 * 3/1R 3/1R P F P AND GATE 1648 * 3/1R 3/1R P F P AND GATE 1650 * 3/1R 3/1R P F P SERIAL SHIFT REGISTER 1651 * 3/1R 3/1R P F P SERIAL SHIFT REGISTER 1652 * 3/1R 3/1R P F P BINARY COUNTER 1653 * 3/1R 3/1R P F P BINARY COUNTER 1654 * 3/1R 3/1R P F P BINARY COUNTER 1655 * 3/1R 3/1R P F P ADDRESSABLE SWITCH 1656 * 3/1R 3/1R P F P ADDRESSABLE SWITCH 1657 * 3/1R 3/1R P F P AMP 1658 * 3/1R 3/1R P F P AMP 1659 * 3/1R 3/1R P F P SWITCHING LADDER 1660 * 3/1R 3/1R P F P SWITCHING LADDER 1660 * 3/1R 3/1R P F P OLARITY DETECTOR 1661 * 3/1R 3/1R P F P OLARITY DETECTOR 1662 * 3/1R 3/1R P F P CONTROL LOGIC 1663 * 3/1R 3/1R P F P REGISTER 1666 * 3/1R 3/1R P F P REGISTER	1632	3/3	3/3				AMP	
1635 3/3 3/3 3/3 FIERMISTER THERMOMETER 1636 3/3 3/1R 3/1R P F P FIELD EFFECT TRANSISTOR 1637 * 3/1R 3/1R P F P FIELD EFFECT TRANSISTOR 1638 3/3 3/3 CONTROL CIRCUIT 1640 * 3/1R 3/1R P F P CONTROL CIRCUIT 1640 * 3/1R 3/1R P F P READ ONLY MEMORY 1641 * 3/1R 3/3 TRANSDUCER TEMP AMP 1642 3/3 3/3 TRANSDUCER TEMP AMP 1643 3/3 3/3 AMP 1644 3/3 3/3 FRANSISTOR 1644 3/3 3/3 FRANSISTOR 1646 3/3 3/3 FRANSISTOR 1647 * 3/1R 3/1R P F P AMP 1648 * 3/1R 3/1R P F P AND GATE 1649 * 3/1R 3/1R P F P AND GATE 1650 * 3/1R 3/1R P F P SERIAL SHIFT REGISTER 1651 * 3/1R 3/1R P F P SERIAL SHIFT REGISTER 1652 * 3/1R 3/1R P F P BINARY COUNTER 1653 * 3/1R 3/1R P F P BINARY COUNTER 1654 * 3/1R 3/1R P F P ADDRESSABLE SWITCH 1655 * 3/1R 3/1R P F P AMP 1657 * 3/1R 3/1R P F P AMP 1658 * 3/1R 3/1R P F P AMP 1658 * 3/1R 3/1R P F P SWITCHING LADDER 1669 * 3/1R 3/1R P F P SWITCHING LADDER 1660 * 3/1R 3/1R P F P CONTROL LOGIC 1661 * 3/1R 3/1R P F P CONTROL LOGIC 1662 * 3/1R 3/1R P F P REGISTER 1665 * 3/1R 3/1R P F P CONTROL LOGIC 1663 * 3/1R 3/1R P F P REGISTER 1666 * 3/1R 3/1R P F P REGISTER	1633	3/3	3/3				AMP	
1636 3/3 3/3 FIELD EFFECT TRANSISTOR 1637 * 3/1R 3/1R P F P FIELD EFFECT TRANSISTOR 1638 3/3 3/3 CONTROL CIRCUIT 1640 * 3/1R 3/1R P F P CONTROL CIRCUIT 1640 * 3/1R 3/1R P F P READ ONLY MEMORY 1641 * 3/1R 3/1R P F P READ ONLY MEMORY 1642 3/3 3/3 TRANSDUCER TEMP AMP 1643 3/3 3/3 TRANSDUCER TEMP AMP 1644 3/3 3/3 TRANSDUCER TEMP AMP 1645 * 3/1R 3/1R P F P AMP 1646 * 3/3 3/3 TRANSISTOR 1647 * 3/1R 3/1R P F P AND GATE 1648 * 3/1R 3/1R P F P AND GATE 1650 * 3/1R 3/1R P F P SERIAL SHIFT REGISTER 1651 * 3/1R 3/1R P F P SERIAL SHIFT REGISTER 1652 * 3/1R 3/1R P F P SERIAL SHIFT REGISTER 1653 * 3/1R 3/1R P F P BINARY COUNTER 1655 * 3/1R 3/1R P F P ADDRESSABLE SWITCH 1656 * 3/1R 3/1R P F P AMP 1657 * 3/1R 3/1R P F P AMP 1658 * 3/1R 3/1R P F P AMP 1659 * 3/1R 3/1R P F P SWITCHING LADDER 1660 * 3/1R 3/1R P F P SWITCHING LADDER 1661 * 3/1R 3/1R P F P CONTROL LOGIC 1663 * 3/1R 3/1R P F P CONTROL LOGIC 1664 * 3/1R 3/1R P F P CONTROL LOGIC 1665 * 3/1R 3/1R P F P REGISTER 1666 * 3/1R	1634	3/3	3/3				THERMISTER THERMOMETER	
1637 * 3/1R 3/1R P F P FIELD EFFECT TRANSISTOR 1638 3/3 3/3 CONTROL CIRCUIT 1640 * 3/1R 3/1R P F P CONTROL CIRCUIT 1640 * 3/1R 3/1R P F P READ ONLY MEMORY 1641 * 3/1R 3/1R P F P READ ONLY MEMORY 1642 3/3 3/3 TRANSDUCER TEMP AMP 1643 3/3 3/3 TRANSDUCER TEMP AMP 1644 3/3 3/3 TRANSDUCER TEMP AMP 1645 * 3/1R 3/1R P F P AMP 1646 3/3 3/3 TRANSISTOR 1647 * 3/1R 3/1R P F P AND GATE 1649 * 3/1R 3/1R P F P AND GATE 1650 * 3/1R 3/1R P F P SERIAL SHIFT REGISTER 1651 * 3/1R 3/1R P F P SERIAL SHIFT REGISTER 1652 * 3/1R 3/1R P F P BINARY COUNTER 1653 * 3/1R 3/1R P F P BINARY COUNTER 1654 * 3/1R 3/1R P F P ADDRESSABLE SWITCH 1655 * 3/1R 3/1R P F P ADDRESSABLE SWITCH 1656 * 3/1R 3/1R P F P AMP 1657 * 3/1R 3/1R P F P AMP 1658 * 3/1R 3/1R P F P SWITCHING LADDER 1659 * 3/1R 3/1R P F P SWITCHING LADDER 1660 * 3/1R 3/1R P F P OLARITY DETECTOR 1661 * 3/1R 3/1R P F P OLARITY DETECTOR 1662 * 3/1R 3/1R P F P CONTROL LOGIC 1663 * 3/1R 3/1R P F P REGISTER 1665 * 3/1R 3/1R P F P REGISTER 1665 * 3/1R 3/1R P F P REGISTER 1666 * 3/1R 3/1R P F P REGISTER	1635	3/3	3/3			-	THERMISTER THERMOMETER	
1638 3/3 3/3 CONTROL CIRCUIT 1640 * 3/1R 3/1R P F P CONTROL CIRCUIT 1640 * 3/1R 3/1R P F P CONTROL CIRCUIT 1641 * 3/1R 3/1R P F P READ ONLY MEMORY 1642 3/3 3/3 TRANSDUCER TEMP AMP 1643 3/3 3/3 TRANSDUCER TEMP AMP 1644 3/3 3/3 AMP 1645 * 3/1R 3/1R P F P AMP 1646 3/3 3/3 TRANSISTOR 1647 * 3/1R 3/1R P F P AMP 1648 * 3/1R 3/1R P F P AND GATE 1649 * 3/1R 3/1R P F P AND GATE 1650 * 3/1R 3/1R P F P SERIAL SHIFT REGISTER 1651 * 3/1R 3/1R P F P SERIAL SHIFT REGISTER 1652 * 3/1R 3/1R P F P BINARY COUNTER 1653 * 3/1R 3/1R P F P BINARY COUNTER 1655 * 3/1R 3/1R P F P ADDRESSABLE SWITCH 1655 * 3/1R 3/1R P F P ADDRESSABLE SWITCH 1656 * 3/1R 3/1R P F P AMP 1657 * 3/1R 3/1R P F P AMP 1658 * 3/1R 3/1R P F P AMP 1658 * 3/1R 3/1R P F P AMP 1659 * 3/1R 3/1R P F P SWITCHING LADDER 1660 * 3/1R 3/1R P F P OLARITY DETECTOR 1661 * 3/1R 3/1R P F P POLARITY DETECTOR 1662 * 3/1R 3/1R P F P CONTROL LOGIC 1663 * 3/1R 3/1R P F P REGISTER 1665 * 3/1R 3/1R P F P REGISTER 1666 * 3/1R 3/1R P F P REGISTER	1636	3/3	3/3				FIELD EFFECT TRANSISTOR	
1639 * 3/1R 3/1R P F P CONTROL CIRCUIT 1640 * 3/1R 3/1R P F P READ ONLY MEMORY 1641 * 3/1R 3/1R P F P READ ONLY MEMORY 1642 3/3 3/3 TRANSDUCER TEMP AMP 1643 3/3 3/3 TRANSDUCER TEMP AMP 1644 3/3 3/3 AMP 1645 * 3/1R 3/1R P F P AMP 1646 3/3 3/3 TRANSISTOR 1647 * 3/1R 3/1R P F P TRANSISTOR 1648 * 3/1R 3/1R P F P AND GATE 1649 * 3/1R 3/1R P F P AND GATE 1650 * 3/1R 3/1R P F P SERIAL SHIFT REGISTER 1651 * 3/1R 3/1R P F P SERIAL SHIFT REGISTER 1652 * 3/1R 3/1R P F P BINARY COUNTER 1653 * 3/1R 3/1R P F P BINARY COUNTER 1654 * 3/1R 3/1R P F P ADDRESSABLE SWITCH 1655 * 3/1R 3/1R P F P ADDRESSABLE SWITCH 1656 * 3/1R 3/1R P F P AMP 1657 * 3/1R 3/1R P F P AMP 1658 * 3/1R 3/1R P F P AMP 1658 * 3/1R 3/1R P F P SWITCHING LADDER 1659 * 3/1R 3/1R P F P SWITCHING LADDER 1660 * 3/1R 3/1R P F P POLARITY DETECTOR 1661 * 3/1R 3/1R P F P POLARITY DETECTOR 1662 * 3/1R 3/1R P F P CONTROL LOGIC 1663 * 3/1R 3/1R P F P REGISTER 1665 * 3/1R 3/1R P F P REGISTER 1666 * 3/1R 3/1R P F P REGISTER 1666 * 3/1R 3/1R P F P REGISTER 1666 * 3/1R 3/1R P F P REGISTER	1637 *	3/1R	3/1R	P	F	P	FIELD EFFECT TRANSISTOR	
1640 * 3/1R 3/1R P F P READ ONLY MEMORY 1641 * 3/1R 3/1R P F P READ ONLY MEMORY 1642 3/3 3/3 TRANSDUCER TEMP AMP 1643 3/3 3/3 TRANSDUCER TEMP AMP 1644 3/3 3/3 AMP 1645 * 3/1R 3/1R P F P AMP 1646 3/3 3/3 TRANSISTOR 1647 * 3/1R 3/1R P F P AND GATE 1648 * 3/1R 3/1R P F P AND GATE 1649 * 3/1R 3/1R P F P AND GATE 1650 * 3/1R 3/1R P F P SERIAL SHIFT REGISTER 1651 * 3/1R 3/1R P F P SERIAL SHIFT REGISTER 1652 * 3/1R 3/1R P F P BINARY COUNTER 1653 * 3/1R 3/1R P F P BINARY COUNTER 1655 * 3/1R 3/1R P F P ADDRESSABLE SWITCH 1655 * 3/1R 3/1R P F P ADDRESSABLE SWITCH 1656 * 3/1R 3/1R P F P AMP 1657 * 3/1R 3/1R P F P AMP 1658 * 3/1R 3/1R P F P SWITCHING LADDER 1669 * 3/1R 3/1R P F P SWITCHING LADDER 1660 * 3/1R 3/1R P F P OLARITY DETECTOR 1661 * 3/1R 3/1R P F P CONTROL LOGIC 1662 * 3/1R 3/1R P F P REGISTER 1665 * 3/1R 3/1R P F P REGISTER 1665 * 3/1R 3/1R P F P REGISTER	1638	3/3	3/3				CONTROL CIRCUIT	
1641 * 3/1R 3/1R P F P READ ONLY MEMORY 1642 3/3 3/3 TRANSDUCER TEMP AMP 1643 3/3 3/3 AMP 1644 3/3 3/3 AMP 1645 * 3/1R 3/1R P F P AMP 1646 3/3 3/3 TRANSUCER TEMP AMP 1646 3/3 TRANSISTOR 1647 * 3/1R 3/1R P F P AND GATE 1649 * 3/1R 3/1R P F P AND GATE 1650 * 3/1R 3/1R P F P AND GATE 1651 * 3/1R 3/1R P F P BINARY COUNTER 1652 * 3/1R 3/1R P F P BINARY COUNTER 1653 * 3/1R 3/1R P F P BINARY COUNTER 1655 * 3/1R 3/1R P F P ADDRESSABLE SWITCH 1656 * 3/1R 3/1R P F P ADDRESSABLE SWITCH 1656 * 3/1R 3/1R P F P AMP 1657 * 3/1R 3/1R P F P AMP 1658 * 3/1R 3/1R P F P AMP 1658 * 3/1R 3/1R P F P SWITCHING LADDER 1669 * 3/1R 3/1R P F P SWITCHING LADDER 1660 * 3/1R 3/1R P F P OLARITY DETECTOR 1661 * 3/1R 3/1R P F P POLARITY DETECTOR 1662 * 3/1R 3/1R P F P CONTROL LOGIC 1663 * 3/1R 3/1R P F P REGISTER 1665 * 3/1R 3/1R P F P REGISTER 1666 * 3/1R 3/1R P F P REGISTER	1639 *	3/1R	3/1R	P	F	P	CONTROL CIRCUIT	
1642 3/3 3/3 TRANSDUCER TEMP AMP 1643 3/3 3/3 AMP 1644 3/3 3/3 AMP 1645 * 3/1R 3/1R P F P AMP 1646 3/3 3/3 TRANSISTOR 1647 * 3/1R 3/1R P F P TRANSISTOR 1648 * 3/1R 3/1R P F P AND GATE 1649 * 3/1R 3/1R P F P AND GATE 1650 * 3/1R 3/1R P F P SERIAL SHIFT REGISTER 1651 * 3/1R 3/1R P F P SERIAL SHIFT REGISTER 1652 * 3/1R 3/1R P F P BINARY COUNTER 1653 * 3/1R 3/1R P F P BINARY COUNTER 1654 * 3/1R 3/1R P F P ADDRESSABLE SWITCH 1655 * 3/1R 3/1R P F P ADDRESSABLE SWITCH 1656 * 3/1R 3/1R P F P AMP 1657 * 3/1R 3/1R P F P AMP 1658 * 3/1R 3/1R P F P AMP 1658 * 3/1R 3/1R P F P AMP 1659 * 3/1R 3/1R P F P SWITCHING LADDER 1660 * 3/1R 3/1R P F P SWITCHING LADDER 1661 * 3/1R 3/1R P F P POLARITY DETECTOR 1661 * 3/1R 3/1R P F P POLARITY DETECTOR 1662 * 3/1R 3/1R P F P CONTROL LOGIC 1663 * 3/1R 3/1R P F P REGISTER 1665 * 3/1R 3/1R P F P REGISTER 1666 * 3/1R 3/1R P F P REGISTER 1666 * 3/1R 3/1R P F P REGISTER	1640 *	3/1R	3/1R					
1643	1641 *	3/1R	3/1R	P	F	P		
1644 3/3 3/1R 3/1R P F P AMP 1645 * 3/1R 3/1R P F P AMP 1646 3/3 3/3 TRANSISTOR 1647 * 3/1R 3/1R P F P TRANSISTOR 1648 * 3/1R 3/1R P F P AND GATE 1649 * 3/1R 3/1R P F P AND GATE 1650 * 3/1R 3/1R P F P SERIAL SHIFT REGISTER 1651 * 3/1R 3/1R P F P SERIAL SHIFT REGISTER 1652 * 3/1R 3/1R P F P BINARY COUNTER 1653 * 3/1R 3/1R P F P BINARY COUNTER 1654 * 3/1R 3/1R P F P ADDRESSABLE SWITCH 1655 * 3/1R 3/1R P F P AMP 1656 * 3/1R 3/1R P F P AMP 1657 * 3/1R 3/1R P F P AMP 1658 * 3/1R 3/1R P F P SWITCHING LADDER 1669 * 3/1R 3/1R P F P SWITCHING LADDER 1660 * 3/1R 3/1R P F P POLARITY DETECTOR 1661 * 3/1R 3/1R P F P CONTROL LOGIC 1663 * 3/1R 3/1R P F P REGISTER 1665 * 3/1R 3/1R P F P REGISTER 1665 * 3/1R 3/1R P F P REGISTER 1666 * 3/1R 3/1R P F P DISCREET INPUT BUFFER	1642	3/3	3/3				TRANSDUCER TEMP AMP	
1645 * 3/1R 3/1R P F P AMP 1646 3/3 3/3 TRANSISTOR 1647 * 3/1R 3/1R P F P TRANSISTOR 1648 * 3/1R 3/1R P F P AND GATE 1649 * 3/1R 3/1R P F P AND GATE 1650 * 3/1R 3/1R P F P SERIAL SHIFT REGISTER 1651 * 3/1R 3/1R P F P SERIAL SHIFT REGISTER 1652 * 3/1R 3/1R P F P BINARY COUNTER 1653 * 3/1R 3/1R P F P BINARY COUNTER 1654 * 3/1R 3/1R P F P ADDRESSABLE SWITCH 1655 * 3/1R 3/1R P F P AMP 1656 * 3/1R 3/1R P F P AMP 1657 * 3/1R 3/1R P F P AMP 1658 * 3/1R 3/1R P F P SWITCHING LADDER 1659 * 3/1R 3/1R P F P SWITCHING LADDER 1660 * 3/1R 3/1R P F P POLARITY DETECTOR 1661 * 3/1R 3/1R P F P POLARITY DETECTOR 1662 * 3/1R 3/1R P F P CONTROL LOGIC 1663 * 3/1R 3/1R P F P REGISTER 1665 * 3/1R 3/1R P F P REGISTER 1666 * 3/1R 3/1R P F P REGISTER	1643	3/3	3/3			_	TRANSDUCER TEMP AMP	
1646 3/3 3/3 TRANSISTOR 1647 * 3/1R 3/1R P F P TRANSISTOR 1648 * 3/1R 3/1R P F P AND GATE 1649 * 3/1R 3/1R P F P AND GATE 1650 * 3/1R 3/1R P F P SERIAL SHIFT REGISTER 1651 * 3/1R 3/1R P F P SERIAL SHIFT REGISTER 1652 * 3/1R 3/1R P F P BINARY COUNTER 1653 * 3/1R 3/1R P F P BINARY COUNTER 1654 * 3/1R 3/1R P F P ADDRESSABLE SWITCH 1655 * 3/1R 3/1R P F P ADDRESSABLE SWITCH 1656 * 3/1R 3/1R P F P AMP 1657 * 3/1R 3/1R P F P AMP 1658 * 3/1R 3/1R P F P SWITCHING LADDER 1669 * 3/1R 3/1R P F P SWITCHING LADDER 1660 * 3/1R 3/1R P F P CONTROL LOGIC 1661 * 3/1R 3/1R P F P CONTROL LOGIC 1663 * 3/1R 3/1R P F P REGISTER 1665 * 3/1R 3/1R P F P REGISTER 1666 * 3/1R 3/1R P F P REGISTER	1644	3/3	3/3				AMP	
1647 * 3/1R 3/1R P F P TRANSISTOR 1648 * 3/1R 3/1R P F P AND GATE 1649 * 3/1R 3/1R P F P AND GATE 1650 * 3/1R 3/1R P F P SERIAL SHIFT REGISTER 1651 * 3/1R 3/1R P F P SERIAL SHIFT REGISTER 1652 * 3/1R 3/1R P F P BINARY COUNTER 1653 * 3/1R 3/1R P F P BINARY COUNTER 1654 * 3/1R 3/1R P F P ADDRESSABLE SWITCH 1655 * 3/1R 3/1R P F P ADDRESSABLE SWITCH 1656 * 3/1R 3/1R P F P AMP 1657 * 3/1R 3/1R P F P AMP 1658 * 3/1R 3/1R P F P SWITCHING LADDER 1669 * 3/1R 3/1R P F P SWITCHING LADDER 1660 * 3/1R 3/1R P F P POLARITY DETECTOR 1661 * 3/1R 3/1R P F P POLARITY DETECTOR 1662 * 3/1R 3/1R P F P CONTROL LOGIC 1663 * 3/1R 3/1R P F P REGISTER 1665 * 3/1R 3/1R P F P REGISTER 1666 * 3/1R 3/1R P F P REGISTER 1666 * 3/1R 3/1R P F P REGISTER 1666 * 3/1R 3/1R P F P REGISTER	1645 *	3/1R	3/1R	P	F	P	AMP	
1648 * 3/1R 3/1R P F P AND GATE 1649 * 3/1R 3/1R P F P AND GATE 1650 * 3/1R 3/1R P F P SERIAL SHIFT REGISTER 1651 * 3/1R 3/1R P F P SERIAL SHIFT REGISTER 1652 * 3/1R 3/1R P F P BINARY COUNTER 1653 * 3/1R 3/1R P F P BINARY COUNTER 1654 * 3/1R 3/1R P F P ADDRESSABLE SWITCH 1655 * 3/1R 3/1R P F P ADDRESSABLE SWITCH 1656 * 3/1R 3/1R P F P AMP 1657 * 3/1R 3/1R P F P AMP 1658 * 3/1R 3/1R P F P SWITCHING LADDER 1659 * 3/1R 3/1R P F P SWITCHING LADDER 1660 * 3/1R 3/1R P F P POLARITY DETECTOR 1661 * 3/1R 3/1R P F P CONTROL LOGIC 1663 * 3/1R 3/1R P F P CONTROL LOGIC 1664 * 3/1R 3/1R P F P REGISTER 1665 * 3/1R 3/1R P F P REGISTER 1666 * 3/1R 3/1R P F P REGISTER 1666 * 3/1R 3/1R P F P REGISTER 1666 * 3/1R 3/1R P F P DISCREET INPUT BUFFER	1646	3/3	3/3				TRANSISTOR	
1649 * 3/1R 3/1R P F P AND GATE 1650 * 3/1R 3/1R P F P SERIAL SHIFT REGISTER 1651 * 3/1R 3/1R P F P SERIAL SHIFT REGISTER 1652 * 3/1R 3/1R P F P BINARY COUNTER 1653 * 3/1R 3/1R P F P BINARY COUNTER 1654 * 3/1R 3/1R P F P ADDRESSABLE SWITCH 1655 * 3/1R 3/1R P F P ADDRESSABLE SWITCH 1656 * 3/1R 3/1R P F P AMP 1657 * 3/1R 3/1R P F P AMP 1658 * 3/1R 3/1R P F P SWITCHING LADDER 1659 * 3/1R 3/1R P F P SWITCHING LADDER 1660 * 3/1R 3/1R P F P POLARITY DETECTOR 1661 * 3/1R 3/1R P F P POLARITY DETECTOR 1662 * 3/1R 3/1R P F P CONTROL LOGIC 1663 * 3/1R 3/1R P F P REGISTER 1665 * 3/1R 3/1R P F P REGISTER 1666 * 3/1R 3/1R P F P REGISTER 1666 * 3/1R 3/1R P F P REGISTER 1666 * 3/1R 3/1R P F P DISCREET INPUT BUFFER	1647 *							
1650 * 3/1R 3/1R P F P SERIAL SHIFT REGISTER 1651 * 3/1R 3/1R P F P SERIAL SHIFT REGISTER 1652 * 3/1R 3/1R P F P BINARY COUNTER 1653 * 3/1R 3/1R P F P BINARY COUNTER 1654 * 3/1R 3/1R P F P ADDRESSABLE SWITCH 1655 * 3/1R 3/1R P F P ADDRESSABLE SWITCH 1656 * 3/1R 3/1R P F P AMP 1657 * 3/1R 3/1R P F P AMP 1658 * 3/1R 3/1R P F P SWITCHING LADDER 1659 * 3/1R 3/1R P F P SWITCHING LADDER 1660 * 3/1R 3/1R P F P POLARITY DETECTOR 1661 * 3/1R 3/1R P F P POLARITY DETECTOR 1662 * 3/1R 3/1R P F P CONTROL LOGIC 1663 * 3/1R 3/1R P F P REGISTER 1665 * 3/1R 3/1R P F P REGISTER 1666 * 3/1R 3/1R P F P REGISTER 1666 * 3/1R 3/1R P F P REGISTER	1648 *							
1651 * 3/1R 3/1R P F P SERIAL SHIFT REGISTER 1652 * 3/1R 3/1R P F P BINARY COUNTER 1653 * 3/1R 3/1R P F P BINARY COUNTER 1654 * 3/1R 3/1R P F P ADDRESSABLE SWITCH 1655 * 3/1R 3/1R P F P AMP 1656 * 3/1R 3/1R P F P AMP 1657 * 3/1R 3/1R P F P AMP 1658 * 3/1R 3/1R P F P SWITCHING LADDER 1659 * 3/1R 3/1R P F P SWITCHING LADDER 1660 * 3/1R 3/1R P F P POLARITY DETECTOR 1661 * 3/1R 3/1R P F P POLARITY DETECTOR 1662 * 3/1R 3/1R P F P CONTROL LOGIC 1663 * 3/1R 3/1R P F P REGISTER 1665 * 3/1R 3/1R P F P REGISTER 1666 * 3/1R 3/1R P F P REGISTER 1666 * 3/1R 3/1R P F P DISCREET INPUT BUFFER	1649 *							
1652 * 3/1R 3/1R P F P BINARY COUNTER 1653 * 3/1R 3/1R P F P BINARY COUNTER 1654 * 3/1R 3/1R P F P ADDRESSABLE SWITCH 1655 * 3/1R 3/1R P F P ADDRESSABLE SWITCH 1656 * 3/1R 3/1R P F P AMP 1657 * 3/1R 3/1R P F P AMP 1658 * 3/1R 3/1R P F P SWITCHING LADDER 1659 * 3/1R 3/1R P F P SWITCHING LADDER 1660 * 3/1R 3/1R P F P POLARITY DETECTOR 1661 * 3/1R 3/1R P F P POLARITY DETECTOR 1662 * 3/1R 3/1R P F P CONTROL LOGIC 1663 * 3/1R 3/1R P F P REGISTER 1665 * 3/1R 3/1R P F P REGISTER 1666 * 3/1R 3/1R P F P REGISTER 1666 * 3/1R 3/1R P F P DISCREET INPUT BUFFER	1650 *							
1653 * 3/1R 3/1R P F P BINARY COUNTER 1654 * 3/1R 3/1R P F P ADDRESSABLE SWITCH 1655 * 3/1R 3/1R P F P ADDRESSABLE SWITCH 1656 * 3/1R 3/1R P F P AMP 1657 * 3/1R 3/1R P F P AMP 1658 * 3/1R 3/1R P F P SWITCHING LADDER 1659 * 3/1R 3/1R P F P SWITCHING LADDER 1660 * 3/1R 3/1R P F P POLARITY DETECTOR 1661 * 3/1R 3/1R P F P POLARITY DETECTOR 1662 * 3/1R 3/1R P F P CONTROL LOGIC 1663 * 3/1R 3/1R P F P CONTROL LOGIC 1664 * 3/1R 3/1R P F P REGISTER 1665 * 3/1R 3/1R P F P REGISTER 1666 * 3/1R 3/1R P F P DISCREET INPUT BUFFER	1651 *							
1654 * 3/1R 3/1R P F P ADDRESSABLE SWITCH 1655 * 3/1R 3/1R P F P ADDRESSABLE SWITCH 1656 * 3/1R 3/1R P F P AMP 1657 * 3/1R 3/1R P F P AMP 1658 * 3/1R 3/1R P F P SWITCHING LADDER 1659 * 3/1R 3/1R P F P SWITCHING LADDER 1660 * 3/1R 3/1R P F P POLARITY DETECTOR 1661 * 3/1R 3/1R P F P POLARITY DETECTOR 1662 * 3/1R 3/1R P F P CONTROL LOGIC 1663 * 3/1R 3/1R P F P CONTROL LOGIC 1664 * 3/1R 3/1R P F P REGISTER 1665 * 3/1R 3/1R P F P REGISTER 1666 * 3/1R 3/1R P F P DISCREET INPUT BUFFER	1652 *	3/1R					The state of the s	
1655 * 3/1R 3/1R P F P ADDRESSABLE SWITCH 1656 * 3/1R 3/1R P F P AMP 1657 * 3/1R 3/1R P F P AMP 1658 * 3/1R 3/1R P F P SWITCHING LADDER 1659 * 3/1R 3/1R P F P SWITCHING LADDER 1660 * 3/1R 3/1R P F P POLARITY DETECTOR 1661 * 3/1R 3/1R P F P POLARITY DETECTOR 1662 * 3/1R 3/1R P F P CONTROL LOGIC 1663 * 3/1R 3/1R P F P REGISTER 1665 * 3/1R 3/1R P F P REGISTER 1666 * 3/1R 3/1R P F P DISCREET INPUT BUFFER	1653 *							
1656 * 3/1R 3/1R P F P AMP 1657 * 3/1R 3/1R P F P AMP 1658 * 3/1R 3/1R P F P SWITCHING LADDER 1659 * 3/1R 3/1R P F P SWITCHING LADDER 1660 * 3/1R 3/1R P F P POLARITY DETECTOR 1661 * 3/1R 3/1R P F P POLARITY DETECTOR 1662 * 3/1R 3/1R P F P CONTROL LOGIC 1663 * 3/1R 3/1R P F P CONTROL LOGIC 1664 * 3/1R 3/1R P F P REGISTER 1665 * 3/1R 3/1R P F P REGISTER 1666 * 3/1R 3/1R P F P DISCREET INPUT BUFFER	1654 *	3/1R	3/1R				ADDRESSABLE SWITCH	
1657 * 3/1R 3/1R P F P AMP 1658 * 3/1R 3/1R P F P SWITCHING LADDER 1659 * 3/1R 3/1R P F P SWITCHING LADDER 1660 * 3/1R 3/1R P F P POLARITY DETECTOR 1661 * 3/1R 3/1R P F P POLARITY DETECTOR 1662 * 3/1R 3/1R P F P CONTROL LOGIC 1663 * 3/1R 3/1R P F P CONTROL LOGIC 1664 * 3/1R 3/1R P F P REGISTER 1665 * 3/1R 3/1R P F P REGISTER 1666 * 3/1R 3/1R P F P DISCREET INPUT BUFFER	1655 *		3/1R					
1658 * 3/1R 3/1R P F P SWITCHING LADDER 1659 * 3/1R 3/1R P F P SWITCHING LADDER 1660 * 3/1R 3/1R P F P POLARITY DETECTOR 1661 * 3/1R 3/1R P F P POLARITY DETECTOR 1662 * 3/1R 3/1R P F P CONTROL LOGIC 1663 * 3/1R 3/1R P F P CONTROL LOGIC 1664 * 3/1R 3/1R P F P REGISTER 1665 * 3/1R 3/1R P F P REGISTER 1666 * 3/1R 3/1R P F P DISCREET INPUT BUFFER	1656 *						AMP	
1659 * 3/1R 3/1R P F P SWITCHING LADDER 1660 * 3/1R 3/1R P F P POLARITY DETECTOR 1661 * 3/1R 3/1R P F P POLARITY DETECTOR 1662 * 3/1R 3/1R P F P CONTROL LOGIC 1663 * 3/1R 3/1R P F P CONTROL LOGIC 1664 * 3/1R 3/1R P F P REGISTER 1665 * 3/1R 3/1R P F P REGISTER 1666 * 3/1R 3/1R P F P DISCREET INPUT BUFFER	1657 *	3/1R	3/1R				AMP	
1660 * 3/1R 3/1R P F P POLARITY DETECTOR 1661 * 3/1R 3/1R P F P POLARITY DETECTOR 1662 * 3/1R 3/1R P F P CONTROL LOGIC 1663 * 3/1R 3/1R P F P CONTROL LOGIC 1664 * 3/1R 3/1R P F P REGISTER 1665 * 3/1R 3/1R P F P REGISTER 1666 * 3/1R 3/1R P F P DISCREET INPUT BUFFER	1658 *	3/1R						
1661 * 3/1R 3/1R P F P POLARITY DETECTOR 1662 * 3/1R 3/1R P F P CONTROL LOGIC 1663 * 3/1R 3/1R P F P CONTROL LOGIC 1664 * 3/1R 3/1R P F P REGISTER 1665 * 3/1R 3/1R P F P REGISTER 1666 * 3/1R 3/1R P F P DISCREET INPUT BUFFER	1659 *	3/1R					SWITCHING LADDER	
1662 * 3/1R 3/1R P F P CONTROL LOGIC 1663 * 3/1R 3/1R P F P CONTROL LOGIC 1664 * 3/1R 3/1R P F P REGISTER 1665 * 3/1R 3/1R P F P REGISTER 1666 * 3/1R 3/1R P F P DISCREET INPUT BUFFER	1660 *		3/1R					
1663 * 3/1R 3/1R P F P CONTROL LOGIC 1664 * 3/1R 3/1R P F P REGISTER 1665 * 3/1R 3/1R P F P REGISTER 1666 * 3/1R 3/1R P F P DISCREET INPUT BUFFER	1661 *	3/1R						
1663 * 3/1R 3/1R P F P CONTROL LOGIC 1664 * 3/1R 3/1R P F P REGISTER 1665 * 3/1R 3/1R P F P REGISTER 1666 * 3/1R 3/1R P F P DISCREET INPUT BUFFER	1662 *			P				
1664 * 3/1R 3/1R P F P REGISTER 1665 * 3/1R 3/1R P F P REGISTER 1666 * 3/1R 3/1R P F P DISCREET INPUT BUFFER	1663 *	3/1R	3/1R	P	F	P	CONTROL LOGIC	
1665 * 3/1R 9 F P REGISTER 1666 * 3/1R 3/1R P F P DISCREET INPUT BUFFER	1664 *	3/1R	3/1R	₽	F	P		
1666 * 3/1R 3/1R P F P DISCREET INPUT BUFFER	1665 *		3/1R	P	F	P	REGISTER	
	1666 *		3/1R	P	F	P	DISCREET INPUT BUFFER	
100/ - 3/IK 3/IK P. P. DISCREET INFUT DOFFER	1667 *	3/1R	3/1R	P	F	P	DISCREET INPUT BUFFER	

^(*) Potential Critical Items.

	CRITIC	ALITY	REDUNDANC	CY CONTRACTOR OF THE CONTRACTO
	FLIGHT	ABORT	SCREENS	
MDAC-ID	H/F	H/F	A B C	ITEM NAME
1668 *	3/1R	3/1R	P F P	SERIAL/PARALLEL CONVERTER
1669 *	3/1R	3/1R	PFP	SERIAL/PARALLEL CONVERTER
1670 *	3/1R	3/1R	PFP	OSCILLATOR
1671 *			PFP	OSCILLATOR
1672 *		3/1R		2 MH2 CLOCK
1673 *			PFP	2 MH2 CLOCK
1674 *	3/1R	3/1R	PFP	1 MH2 CLOCK
1675 *	3/1R	3/1R	PFP	1 MH2 CLOCK
1676 *	3/1R	3/1R	PFP	500 MH2 CLOCK
1676 * 1677 * 1678 * 1679 * 1680 * 1681 * 1682 * 1683 *	3/1R	3/1R	PFP	500 MH2 CLOCK
1678 *	3/1R	3/1R	PFP	COUNTER
1679 *	3/1R	3/1R	PFP	COUNTER
1680 *	3/1R	3/1R	PFP	OR GATE OR GATE OR GATE SENSOR WINDOW GENERATOR SENSOR WINDOW GENERATOR BUFFER BUFFER OUTPUT CONTROL
1681 *	3/1R	3/1R	PFP	OR GATE
1682 *	3/1R	3/1R	PFP	SENSOR WINDOW GENERATOR
1683 *	3/1R	3/1R	PFP	SENSOR WINDOW GENERATOR
T004	J/ ±10	3/1R	PFP	BUFFER
1685 *	3/1R	3/1R	PFP	BUFFER
	3/1R	3/1R	PFP	OUTPUT CONTROL
	3/1R	2/ TV	E E E	OUTIOI CONTROL
	3/1R		PFP	ENCODER
	3/1R			
	3/1R			
1691 *	3/1R	3/1R		
1692 *	3/1R		PFP	
	3/1R	3/1R	PFP	SELECTOR LOGIC
1694 *	3/1R 3/1R 3/1R 3/1R 3/1R	3/1R	PFP	SELECTOR LOGIC
1695 *	3/1K	3/1R 3/1R	PFP	READ ONLY MEMORY
1696 *	3/1K	3/1R		ROM
1697 *	3/1K	3/1R		READ/WRITE MEMORY
1698 * 1699 *	3/1R 3/1R	3/1R	P F P P F P P F P	READ/WRITE MEMORY
T033 ~	2\ TK	3/ IK	FFF	MALL HALL

^(*) Potential Critical Items.

HIGHEST CRITICALITY HDW/FUNC 6/11/87 DATE: FLIGHT: 3/1R SUBSYSTEM: MECH/ADP 3/1R ABORT: MDAC ID: 1101 ITEM: MOTOR FAILURE MODE: FAILS TO OPERATE LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) AIR DATA SUBSYSTEM 3) MECHANICAL 4) 5) 6) 7) 8) 9) (1) 11 (1) 11 (1) 11 (1) 11 (1) 11 (1) 11 (1) 11 (1) 11 (1) 11 (1) 11 (1) 11 (1) 11 (1) 11 (1) 11 (1) 11 (1) 1 CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE RTLS: 3/1R
TAL: 3/1R
AOA: 3/1R
ATO: / PRELAUNCH: / LIFTOFF: ONORBIT: 3/1R DEORBIT: LANDING/SAFING: 3/3 REDUNDANCY SCREENS: A [2] B [F] C [P] LOCATION: FORWARD FUSELAGE PART NUMBER: MA.ADS.MTR CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: LOSS OF MOTOR WILL CAUSE PROBE TO DEPLOY ON ONE MOTOR.

REFERENCES:

HIGHEST CRITICALITY HDW/FUNC 6/11/87 DATE: FLIGHT: 3/1R SUBSYSTEM: MECH/ADP 3/1R ABORT: MDAC ID: 1102 ITEM: **GEARBOX** FAILURE MODE: JAMMED LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM AIR DATA SUBSYSTEM 2) 3) MECHANICAL 4) 5) 6) 7) 8) 9) CRITICALITIES HDW/FUNC FLIGHT PHASE HDW/FUNC ABORT PRELAUNCH: RTLS: 3/1R TAL: 3/1R LIFTOFF: AOA: 3/1R ONORBIT: 3/1R ATO: DEORBIT: LANDING/SAFING: 3/3 A[2] B[F] C[P] REDUNDANCY SCREENS: LOCATION: FORWARD FUSELAGE

PART NUMBER: MA.ADS.GB

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE: PROBE WILL NOT DEPLOY.

REFERENCES:

HIGHEST CRITICALITY HDW/FUNC DATE: 6/11/87 FLIGHT: 3/1R SUBSYSTEM: MECH/ADP 3/1R ABORT: MDAC ID: 1103 **GEARBOX** ITEM: FAILURE MODE: BROKEN GEAR SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: A.D. MONTGOMERY BREAKDOWN HIERARCHY: MECHANICAL ACTUATION SYSTEM 1) AIR DATA SUBSYSTEM 2) MECHANICAL 3) 4) 5) 6) 7) 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE RTLS: 3/1R PRELAUNCH: TAL: 3/1R LIFTOFF: AOA: 3/1R ONORBIT: 3/1R ATO: DEORBIT: LANDING/SAFING: 3/3 B[F] C[P] REDUNDANCY SCREENS: A [2] FORWARD FUSELAGE LOCATION: PART NUMBER: MA.ADS.GB CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: PROBE WILL NOT DEPLOY.

HIGHEST CRITICALITY HDW/FUNC 6/11/87 DATE: 3/1R SUBSYSTEM: MECH/ADP FLIGHT: 3/1R ABORT: MDAC ID: 1104 PRESSURE LINE ITEM: FAILURE MODE: LEAKAGE SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: A.D. MONTGOMERY BREAKDOWN HIERARCHY: MECHANICAL ACTUATION SYSTEM AIR DATA SUBSYSTEM 2) MECHANICAL 3) 4) 5) 6) 7) 8) 9) CRITICALITIES HDW/FUNC HDW/FUNC ABORT FLIGHT PHASE 3/1R RTLS: PRELAUNCH: LIFTOFF: TAL: 3/1R AOA: 3/1R ONORBIT: 3/1R ATO: DEORBIT: LANDING/SAFING: 3/3 REDUNDANCY SCREENS: A [2] B [F] C [P] LOCATION: FORWARD FUSELAGE PART NUMBER: MA.ADS.PL CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: LEAKAGE OF THE PRESSURE LINE WILL RESULT IN INCORRECT PRESSURES BEING RECEIVED BY THE ADTAS.

REFERENCES:

HIGHEST CRITICALITY HDW/FUNC DATE: 6/11/87 FLIGHT: 3/1R SUBSYSTEM: MECH/ADP ABORT: 3/1R MDAC ID: 1105 ITEM: PROBE FAILURE MODE: JAMMED LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) AIR DATA SUBSYSTEM 3) MECHANICAL 4) 5) 6) 7) 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE RTLS: TAL: AOA: 3/1R PRELAUNCH: 3/1R LIFTOFF: 3/1R ONORBIT: ATO: 3/1R DEORBIT: LANDING/SAFING: 3/3 REDUNDANCY SCREENS: A [2] B [F] C [P] LOCATION: FORWARD FUSELAGE PART NUMBER: MA.ADS.PRB CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: PROBE WILL NOT DEPLOY.

HIGHEST CRITICALITY HDW/FUNC 6/11/87 DATE: 3/1R FLIGHT: SUBSYSTEM: MECH/ADP 3/1R ABORT: MDAC ID: 1106 PROBE ITEM: FAILURE MODE: CLOGGED PORT SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: A.D. MONTGOMERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM PRESSURE ASSEMBLY 2) 3) AIR DATA SUBSYSTEM MECHANICAL 4) 5) 6) 7) 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE 3/1R RTLS: PRELAUNCH: 3/1R TAL: LIFTOFF:

3/1R AOA: ONORBIT: ATO: 3/1R DEORBIT:

LANDING/SAFING: 3/3

REDUNDANCY SCREENS: A [2] B [F] C [P]

FORWARD FUSELAGE LOCATION:

PART NUMBER: MA.ADS.PRB

CAUSES: CONTAMINATION

EFFECTS/RATIONALE:

BLOCKAGE OF THE PROBE PRESSURE PORTS WILL RESULT IN INCORRECT

PRESSURES BEING RECEIVED BY THE ADTAS.

REFERENCES:

HIGHEST CRITICALITY HDW/FUNC DATE: 6/11/87 FLIGHT: 3/1R SUBSYSTEM: MECH/ADP 3/1R ABORT: MDAC ID: 1107 ITEM: SHAFT FAILURE MODE: BROKEN LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM AIR DATA SUBSYSTEM 3) MECHANICAL 4) 5) 6) 7) 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE RTLS: TAL: AOA: 3/1R 3/1R PRELAUNCH: LIFTOFF: 3/1R ONORBIT: DEORBIT: 3/1R ATO: / / / 1... LANDING/SAFING: 3/3 REDUNDANCY SCREENS: A [2] B [F] C [P] FORWARD FUSELAGE LOCATION: PART' NUMBER: MA.ADS.SHF CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: PROBE WILL NOT DEPLOY.

HIGHEST CRITICALITY HDW/FUNC 6/11/87 DATE: 3/1R FLIGHT: SUBSYSTEM: MECH/ADP 3/1R ABORT: MDAC ID: 1108 ITEM: SHAFT FAILURE MODE: BENT LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) AIR DATA SUBSYSTEM MECHANICAL 3) 4) 5) 6) 7) 8) 9) CRITICALITIES FLIGHT PHASE HDW/FUNC ABORT HDW/FUNC RTLS: 3/1R PRELAUNCH: LIFTOFF: TAL: 3/1R 3/1R AOA: ONORBIT:

REDUNDANCY SCREENS: A [2] B [F] C [P]

3/1R

FORWARD FUSELAGE LOCATION:

LANDING/SAFING: 3/3

PART NUMBER: MA.ADS.SHF

DEORBIT:

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

WILL CAUSE PROBE TO DEPLOY AT AN INCORRECT ATTITUDE. THIS WILL

ATO:

IN TURN CAUSE INCORRECT PRESSURES TO BE SENT TO THE ADTAS.

REFERENCES:

DATE: 7/24/87 SUBSYSTEM: MECH/ADP MDAC ID: 1109	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: 3/3
ITEM: DEPLOY MICROSWITCH FAILURE MODE: FAILS CLOSED	
LEAD ANALYST: A.D. MONTGOMERY	SUBSYS LEAD: H.J. LOWERY
BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) AIR DATA SUBSYSTEM 3) MECHANICAL	internal to the second of the
4) 5) 6) 7) 8)	
CRITICALITIES	
FLIGHT PHASE HDW/FUNC PRELAUNCH: / LIFTOFF: / ONORBIT: / DEORBIT: 3/3 LANDING/SAFING: 3/3	ABORT HDW/FUNC RTLS: 3/3 TAL: 3/3 AOA: 3/3 ATO: /
REDUNDANCY SCREENS: A []	B[] C[]
LOCATION: FORWARD FUSELAGE PART NUMBER: ADS.MCH.MS.DEP	
CAUSES: PIECE-PART STRUCTURAL FAIL	
EFFECTS/RATIONALE: DISPLAYS WILL SHOW THAT AIR DATA PR	OBE IS ALWAYS DEPLOYED.
REFERENCES:	

DATE: 7/24/87 SUBSYSTEM: MECH/ADP MDAC ID: 1110	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: 3/3
ITEM: DEPLOY MICROSWITCH FAILURE MODE: FAILS OPEN	
LEAD ANALYST: A.D. MONTGOMERY	SUBSYS LEAD: H.J. LOWERY
BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) AIR DATA SUBSYSTEM 3) MECHANICAL 4) 5) 6) 7) 8)	
CRITICAL	ITTES
FLIGHT PHASE HDW/FUNC	ABORT HDW/FUNC
PRELAUNCH: /	RTLS: 3/3
LIFTOFF: /	TAL: 3/3
ONORBIT: / DEORBIT: 3/3	AOA: 3/3 ATO: /
ONORBIT: / DEORBIT: 3/3 LANDING/SAFING: 3/3	A10.
REDUNDANCY SCREENS: A []	B[] C[]
LOCATION: FORWARD FUSELAGE PART NUMBER: ADS.MCH.MS.DEP	•
CAUSES: PIECE-PART STRUCTURAL FAIL	URE
EFFECTS/RATIONALE: DISPLAYS WILL NEVER SHOW THAT AIR D	ATA PROBE IS DEPLOYED.

DATE: 7/24/87 SUBSYSTEM: MECH/ADP MDAC ID: 1111	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: 3/3
ITEM: STOW MICROSWITCH FAILURE MODE: FAILS CLOSED	
LEAD ANALYST: A.D. MONTGOMERY	SUBSYS LEAD: H.J. LOWERY
BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) AIR DATA SUBSYSTEM 3) MECHANICAL 4) 5) 6) 7) 8)	
CRITICAL	
FLIGHT PHASE HDW/FUNC PRELAUNCH: / LIFTOFF: / ONORBIT: / DEORBIT: 3/3 LANDING/SAFING: 3/3	ABORT HDW/FUNC RTLS: 3/3 TAL: 3/3 AOA: 3/3 ATO: /
REDUNDANCY SCREENS: A []	в[] С[]
LOCATION: FORWARD FUSELAGE PART NUMBER: ADS.MCH.MS.STW	
CAUSES: PIECE-PART STRUCTURAL FAIL	URE
EFFECTS/RATIONALE: DISPLAYS WILL SHOW THAT AIR DATA PR	OBE IS ALWAYS STOWED.
DEFEDENCES.	

DATE: 7/24/87 SUBSYSTEM: MECH/ADP MDAC ID: 1112	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: 3/3
ITEM: STOW MICROSWITCH FAILURE MODE: FAILS OPEN	
LEAD ANALYST: A.D. MONTGOMERY	SUBSYS LEAD: H.J. LOWERY
BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) AIR DATA SUBSYSTEM 3) MECHANICAL 4) 5) 6) 7) 8)	·
CRITICAL	
FLIGHT PHASE HDW/FUNC PRELAUNCH: / LIFTOFF: / ONORBIT: / DEORBIT: 3/3 LANDING/SAFING: 3/3	ABORT HDW/FUNC RTLS: 3/3 TAL: 3/3 AOA: 3/3 ATO: /
REDUNDANCY SCREENS: A []	в[] с[]
LOCATION: FORWARD FUSELAGE PART NUMBER: ADS.MCH.MS.STW	
CAUSES: PIECE-PART STRUCTURAL FAIL	URE
EFFECTS/RATIONALE: DISPLAYS WILL NEVER SHOW THAT AIR D	ATA PROBE IS STOWED.
REFERENCES:	

HIGHEST CRITICALITY HDW/FUNC 7/24/87 DATE: 3/1R SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: ABORT: 3/1R 1500 MDAC ID:

+28V CONTACT #1 ITEM: FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- DISPLAY AND CONTROLS 4)
- SWITCHES 5)
- RIGHT AIR DATA PROBE
- DEPLOY POSITION 7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	7	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	<i>'</i> /	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	: 3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: DISPLAY AND CONTROL PANEL C3

PART NUMBER: ADS.DC.SW.RP.DEP.CN1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO EMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD CAUSE UNCOMMANDED DEPLOYMENT OF AIR DATA PROBE.

HIGHEST CRITICALITY HDW/FUNC 7/24/87 DATE:

FLIGHT: 3/1R SUBSYSTEM: MECH/ADP/EPD&C ABORT: 3/1R 1501 MDAC ID:

+28V CONTACT #1 ITEM:

FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- MECHANICAL ACTUATION SYSTEM
- AIR DATA SUBSYSTEM 2)
- 3) ELECTRICAL
- 4) DISPLAY AND CONTROLS
- SWITCHES 5)
- RIGHT AIR DATA PROBE 6)
- 7) DEPLOY POSITION

8) 9)

CRITICALITIES

Value - Value			
HDW/FUNC	ABORT	HDW/FUNC	
,	RTLS:	3/1R	
,	TAL:	3/1R	
/	AOA:	3/1R	
3/1R	ATO:	/	
: 3/3			
	/ / 3/1R	/ RTLS: / TAL: / AOA: 3/1R ATO:	

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: DISPLAY AND CONTROL PANEL C3

PART NUMBER: ADS.DC.SW.RP.DEP.CN1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT THE PROBE

FROM DEPLOYING.

HIGHEST CRITICALITY HDW/FUNC 7/24/87 DATE:

SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: 3/1R MDAC ID: 1502 ABORT: 3/1R

+28V CONTACT #2 ITEM: FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAY AND CONTROLS
- 5) SWITCHES
- RIGHT AIR DATA PROBE 6)
- DEPLOY POSITION

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	,	AOA:	3/1R
DEORBIT:	3/1R	ATO:	7-
LANDING/SAFING	: 3/3		7. * 1 == T, 11 == 7. 12 1

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: DISPLAY AND CONTROL PANEL C3

PART NUMBER: ADS.DC.SW.RP.DEP.CN2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD CAUSE UNCOMMANDED DEPLOYMENT OF AIR DATA PROBE.

DATE: 7/24/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: 3/1R MDAC ID: 1503 ABORT: 3/1R

ITEM: +28V CONTACT #2

FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAY AND CONTROLS
- 5) SWITCHES
- 6) RIGHT AIR DATA PROBE
- 7) DEPLOY POSITION
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	,	RTLS:	3/1R	
LIFTOFF:	/	TAL:	3/1R	
ONORBIT:	1	AOA:	3/1R	
DEORBIT:	3/1R	ATO:	/	
TAMBING /GARING.	o'/1D			

LANDING/SAFING: 3/1R

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: DISPLAY AND CONTROL PANEL C3

PART NUMBER: ADS.DC.SW.RP.DEP.CN2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT THE PROBE

FROM DEPLOYING.

DATE: 7/24/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: 3/1R MDAC ID: 1504 ABORT: 3/1R

ITEM: +28V CONTACT #3
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAY AND CONTROLS
- 5) SWITCHES
- 6) RIGHT AIR DATA PROBE
- 7) DEPLOY POSITION

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	,	RTLS:	3/1R
LIFTOFF:	7	TAL:	3/1R
ONORBIT:	7	AOA:	3/1R
DEORBIT:	3/1R	ATO:	,
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: DISPLAY AND CONTROL PANEL C3

PART NUMBER: ADS.DC.SW.RP.DEP.CN3

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD CAUSE UNCOMMANDED DEPLOYMENT OF AIR DATA PROBE.

DATE: 7/24/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: 3/1R MDAC ID: 1505 ABORT: 3/1R

MDAC ID: 1505

ITEM: +28V CONTACT #3

FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAY AND CONTROLS
- 5) SWITCHES
- 6) RIGHT AIR DATA PROBE
- 7) DEPLOY POSITION

8) · 9)

CRITICALITIES

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FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	./	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: DISPLAY AND CONTROL PANEL C3

PART NUMBER: ADS.DC.SW.RP.DEP.CN3

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT THE PROBE

FROM DEPLOYING.

DATE:

7/24/87

HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: MECH/ADP/EPD&C

FLIGHT:

3/1R

MDAC ID:

1506

ABORT:

3/1R

ITEM:

+28V CONTACT #4

FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- DISPLAY AND CONTROLS 4)
- SWITCHES 5)
- RIGHT AIR DATA PROBE 6)
- DEPLOY POSITION 7)

8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	7	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	,	AOA:	3/1R
DEORBIT:	3/1R	ATO:	
LANDING/SAFING	3/3	en e	The second of th

REDUNDANCY SCREENS: A [2]

B [F]

C[P]

LOCATION:

DISPLAY AND CONTROL PANEL C3

PART' NUMBER: ADS.DC.SW.RP.DEP.CN4

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD CAUSE UNCOMMANDED

DEPLOYMENT OF AIR DATA PROBE.

HIGHEST CRITICALITY HDW/FUNC 7/24/87 DATE:

SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: 3/1R ABORT: 3/1R MDAC ID: 1507

+28V CONTACT #4 ITEM:

FAILURE MODE: FAILS OPEN

SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: A.D. MONTGOMERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAY AND CONTROLS
- 5) SWITCHES
- RIGHT AIR DATA PROBE 6)
- DEPLOY POSITION 7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	7	RTLS:	3/1R
LIFTOFF:	,	TAL:	3/1R
ONORBIT:	,	AOA:	3/1R ·
DEORBIT:	3/1R	- ATO:	/
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: DISPLAY AND CONTROL PANEL C3

PART NUMBER: ADS.DC.SW.RP.DEP.CN4

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT THE PROBE

FROM DEPLOYING.

DATE: 7/24/87 SUBSYSTEM: MECH/ADP/EPD&C MDAC ID: 1508	FLIGHT: 3/3 ABORT: 3/3
ITEM: +28V CONTACT #1 FAILURE MODE: FAILS SHORTED	
LEAD ANALYST: A.D. MONTGOMERY	SUBSYS LEAD: H.J. LOWERY
BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) AIR DATA SUBSYSTEM 3) ELECTRICAL 4) DISPLAY AND CONTROLS 5) SWITCHES 6) RIGHT AIR DATA PROBE 7) DEPLOY/HEAT POSITION 8) 9)	
СВТТГСА	LITIES
FLIGHT PHASE HDW/FUNC	ABORT HDW/FUNC
PRELAUNCH: /	RTLS: 3/3
LIFTOFF: /	TAL: 3/3
ONORBIT: /	AOA: 3/3
DEORBIT: 3/3	ATO: /
LANDING/SAFING: 3/3	
REDUNDANCY SCREENS: A []	B [] C []
LOCATION: DISPLAY AND CONTROL PART NUMBER: ADS.DC.SW.RP.DEP.CN1	
CAUSES: PIECE-PART STRUCTURAL FAI	LURE
EFFECTS/RATIONALE:	
NO EFFECT.	

DATE: 7/24/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: 3/1R

MDAC ID: 1509 ABORT: 3/1R

ITEM: +28V CONTACT #1

FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAY AND CONTROLS
- 5) SWITCHES
- 6) RIGHT AIR DATA PROBE
- 7) DEPLOY/HEAT POSITION

8) 9)

CRITICALITIES

FLIGHT PHASE F	IDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	,	RTLS:	3/1R
LIFTOFF:	<i>'</i> /	TAL:	3/1R
ONORBIT:	<i>'</i> /	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: DISPLAY AND CONTROL PANEL C3

PART NUMBER: ADS.DC.SW.RP.DEP.CN1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT HEATER OPERATION. THIS COULD RESULT IN ERRONEOUS OR NO AIR DATA REACHING THE ADTAS.

HIGHEST CRITICALITY HDW/FUNC 7/24/87 DATE: FLIGHT: 3/3 SUBSYSTEM: MECH/ADP/EPD&C 3/3 ABORT: MDAC: ID: 1510 +28V CONTACT #2 ITEM: FAILURE MODE: FAILS SHORTED LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) AIR DATA SUBSYSTEM ELECTRICAL 4) DISPLAY AND CONTROLS SWITCHES 6) RIGHT AIR DATA PROBE DEPLOY/HEAT POSITION 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC
/ RTLS: 3/3
/ TAL: 3/3
/ AOA: 3/3 FLIGHT PHASE PRELAUNCH: LIFTOFF: ONORBIT: LANDING/SAFING: 3/3 ATO: REDUNDANCY SCREENS: A [] B [] C [] LOCATION: DISPLAY AND CONTROL PANEL C3 PART NUMBER: ADS.DC.SW.RP.DEP.CN2 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO EFFECT. REFERENCES:

DATE: 7/24/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: 3/1R MDAC ID: 1511 ABORT: 3/1R

ITEM: +28V CONTACT #2

FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAY AND CONTROLS
- 5) SWITCHES
- 6) RIGHT AIR DATA PROBE
- 7) DEPLOY/HEAT POSITION
- 8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	,	RTLS:	3/1R
LIFTOFF:	,	TAL:	3/1R
ONORBIT:	,	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING.	3/3		<u>-</u>

LANDING/SAFING: 3/3

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: DISPLAY AND CONTROL PANEL C3

PART NUMBER: ADS.DC.SW.RP.DEP.CN2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT HEATER OPERATION. THIS COULD RESULT IN ERRONEOUS OR NO AIR DATA REACHING THE ADTAS.

HIGHEST CRITICALITY HDW/FUNC 7/24/87 DATE: SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: 3/3 ABORT: 3/3 1512 MDAC ID: +28V CONTACT #3 ITEM: FAILURE MODE: FAILS SHORTED LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM AIR DATA SUBSYSTEM 3) ELECTRICAL DISPLAY AND CONTROLS 4) SWITCHES 5) RIGHT AIR DATA PROBE DEPLOY/HEAT POSITION 7) 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE RTLS: 3/3 PRELAUNCH: / TAL: 3/3 LIFTOFF: 3/3 AOA: ONORBIT: 3/3 ATO: DEORBIT: LANDING/SAFING: 3/3 REDUNDANCY SCREENS: A [] B [] C [] LOCATION: DISPLAY AND CONTROL PANEL C3 PART NUMBER: ADS.DC.SW.RP.DEP.CN3 PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO EFFECT.

DATE: 7/24/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: 3/1R MDAC ID: 1513 ABORT: 3/1R

ITEM: +28V CONTACT #3

FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAY AND CONTROLS
- 5) SWITCHES
- 6) RIGHT AIR DATA PROBE
- 7) DEPLOY/HEAT POSITION

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	,	RTLS:	3/1R
LIFTOFF:	,	TAL:	3/1R
ONORBIT:	,	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: DISPLAY AND CONTROL PANEL C3

PART NUMBER: ADS.DC.SW.RP.DEP.CN3

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT HEATER OPERATION. THIS COULD RESULT IN ERRONEOUS OR NO AIR DATA REACHING THE ADTAS.

HIGHEST CRITICALITY HDW/FUNC 7/24/87 DATE: SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: 3/3 3/3 ABORT: MDAC ID: 1514 +28V CONTACT #4 ITEM: FAILURE MODE: FAILS SHORTED LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM AIR DATA SUBSYSTEM ELECTRICAL 3) DISPLAY AND CONTROLS 4) SWITCHES RIGHT AIR DATA PROBE DEPLOY/HEAT POSITION 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE RTLS: TAL: AOA: ATO: 3/3 PRELAUNCH: / 3/3 LIFTOFF: 3/3 ONORBIT: DEORBIT: LANDING/SAFING: 3/3 REDUNDANCY SCREENS: A [] B [] C [] LOCATION: DISPLAY AND CONTROL PANEL C3 PART NUMBER: ADS.DC.SW.RP.DEP.CN4 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE:

REFERENCES:

NO EFFECT.

DATE: 7/24/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: 3/1R MDAC ID: 1515 ABORT: 3/1R

ITEM: +28V CONTACT #4

FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAY AND CONTROLS
- 5) SWITCHES
- 6) RIGHT AIR DATA PROBE
- 7) DEPLOY/HEAT POSITION

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	/	RTLS:	3/1R	
LIFTOFF:	/	TAL:	3/1R	
ONORBIT:	/	AOA:	3/1R	
DEORBIT:	3/1R	ATO:	7	
TAMBENG /CARTNO.			•	

LANDING/SAFING: 3/3

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: DISPLAY AND CONTROL PANEL C3

PART NUMBER: ADS.DC.SW.RP.DEP.CN4

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT HEATER OPERATION. THIS COULD RESULT IN ERRONEOUS OR NO AIR DATA REACHING THE ADTAS.

HIGHEST CRITICALITY HDW/FUNC 7/24/87 DATE: 3/1R FLIGHT: SUBSYSTEM: MECH/ADP/EPD&C 3/1R ABORT: MDAC ID: 1516 +28V CONTACT #1 ITEM: FAILURE MODE: FAILS SHORTED LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: MECHANICAL ACTUATION SYSTEM 1) AIR DATA SUBSYSTEM ELECTRICAL 3) DISPLAY AND CONTROLS 4) 5) **SWITCHES** RIGHT AIR DATA PROBE 6) STOW POSITION 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE RTLS: 3/1R PRELAUNCH: / TAL: 3/1R LIFTOFF: AOA: 3/1R ONORBIT: ATO: 3/1R DEORBIT: LANDING/SAFING: 3/3 REDUNDANCY SCREENS: A [2] B[F] C[P]

DISPLAY AND CONTROL PANEL C3 LOCATION:

PART NUMBER: ADS.DC.SW.RP.STW.CN1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD CAUSE UNCOMMANDED

STOWAGE OF PROBE.

HIGHEST CRITICALITY HDW/FUNC DATE: 7/24/87 SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: 3/3 MDAC ID: 1517 ABORT: 3/3 ITEM: +28V CONTACT #1 FAILURE MODE: FAILS OPEN LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM AIR DATA SUBSYSTEM 2) 3) ELECTRICAL 4) DISPLAY AND CONTROLS 5) SWITCHES 6) RIGHT AIR DATA PROBE 7) STOW POSITION 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE PRELAUNCH: RTLS: 3/3 TAL: LIFTOFF: 3/3 ONORBIT: AOA: 3/3 **DEORBIT:** 3/3 ATO: LANDING/SAFING: 3/3 REDUNDANCY SCREENS: A | B | C |] LOCATION: DISPLAY AND CONTROL PANEL C3 PART NUMBER: ADS.DC.SW.RP.STW.CN1 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT STOWAGE OF THE PROBE.

HIGHEST CRITICALITY HDW/FUNC 7/24/87 DATE: SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: 3/1R ABORT: 3/1R MDAC ID: 1518 +28V CONTACT #2 ITEM: FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- AIR DATA SUBSYSTEM 2)
- ELECTRICAL 3)
- DISPLAY AND CONTROLS 4)
- SWITCHES 5)
- RIGHT AIR DATA PROBE 6)
- STOW POSITION

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/3	i e e e e e e e e e e e e e e	

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: DISPLAY AND CONTROL PANEL C3 PART NUMBER: ADS.DC.SW.RP.STW.CN2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD CAUSE UNCOMMANDED STOWAGE OF PROBE.

HIGHEST CRITICALITY HDW/FUNC DATE: 7/24/87 SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: 3/3 ABORT: 3/3 MDAC ID: 1519 +28V CONTACT #2 ITEM: FAILURE MODE: FAILS OPEN SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: A.D. MONTGOMERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) AIR DATA SUBSYSTEM 3) ELECTRICAL 4) DISPLAY AND CONTROLS 5) SWITCHES 6) RIGHT AIR DATA PROBE 7) STOW POSITION 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE RTLS: PRELAUNCH: / 3/3 TAL: LIFTOFF: 3/3 ONORBIT: AOA: 3/3 3/3 DEORBIT: ATO: LANDING/SAFING: 3/3 REDUNDANCY SCREENS: A [] B [] C [1 LOCATION: DISPLAY AND CONTROL PANEL C3 PART NUMBER: ADS.DC.SW.RP.STW.CN2 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT STOWAGE OF THE PROBE.

7/24/87 HIGHEST CRITICALITY HDW/FUNC DATE: SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: 3/1R 3/1R ABORT: 1520 MDAC ID: +28V CONTACT #3 ITEM: FAILURE MODE: FAILS SHORTED SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: A.D. MONTGOMERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) AIR DATA SUBSYSTEM ELECTRICAL DISPLAY AND CONTROLS 4)

6) RIGHT AIR DATA PROBE 7) STOW POSITION

SWITCHES

8) 9)

5)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	,	TAL:	3/1R
ONORBIT:	,	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: DISPLAY AND CONTROL PANEL C3

PART NUMBER: ADS.DC.SW.RP.STW.CN3

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD CAUSE UNCOMMANDED STOWAGE OF PROBE.

HIGHEST CRITICALITY HDW/FUNC DATE: 7/24/87 3/3 SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: 3/3 MDAC ID: 1521 ABORT: ITEM: +28V CONTACT #3 FAILURE MODE: FAILS OPEN SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: A.D. MONTGOMERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM AIR DATA SUBSYSTEM 2) 3) ELECTRICAL 4) DISPLAY AND CONTROLS SWITCHES 5) RIGHT AIR DATA PROBE 6) 7) STOW POSITION 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE RTLS: 3/3 PRELAUNCH: TAL: 3/3 LIFTOFF: 1 AOA: 3/3 ONORBIT: 3/3 ATO: DEORBIT: LANDING/SAFING: 3/3 REDUNDANCY SCREENS: A [] B [] C [] LOCATION: DISPLAY AND CONTROL PANEL C3 PART NUMBER: ADS.DC.SW.RP.STW.CN3 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT STOWAGE

REFERENCES:

OF THE PROBE.

HIGHEST CRITICALITY HDW/FUNC 7/24/87 DATE: FLIGHT: 3/1R SUBSYSTEM: MECH/ADP/EPD&C 3/1R ABORT: MDAC ID: 1522

+28V CONTACT #4 ITEM: FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAY AND CONTROLS
- SWITCHES 5)
- RIGHT AIR DATA PROBE 6)
- STOW POSITION

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	,	RTLS:	3/1R
LIFTOFF:	,	TAL:	3/1R
ONORBIT:	,	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/3		·

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: DISPLAY AND CONTROL PANEL C3

PART' NUMBER: ADS.DC.SW.RP.STW.CN4

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD CAUSE UNCOMMANDED STOWAGE OF PROBE.

HIGHEST CRITICALITY HDW/FUNC 7/24/87 DATE: 3/3 SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: 3/3 ABORT: MDAC ID: 1523 ITEM: +28V CONTACT #4 FAILURE MODE: FAILS OPEN LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) AIR DATA SUBSYSTEM 3) ELECTRICAL DISPLAY AND CONTROLS 4) 5) SWITCHES RIGHT AIR DATA PROBE 6) 7) STOW POSITION 8) 9) CRITICALITIES FLIGHT PHASE HDW/FUNC HDW/FUNC ABORT 3/3 RTLS: PRELAUNCH: TAL: 3/3 LIFTOFF: AOA: 3/3 ONORBIT: ATO: 3/3 DEORBIT: LANDING/SAFING: 3/3 B[] C[REDUNDANCY SCREENS: A [] DISPLAY AND CONTROL PANEL C3 LOCATION: PART NUMBER: ADS.DC.SW.RP.STW.CN4 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT STOWAGE OF THE PROBE.

DATE:

7/24/87

HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: MECH/ADP/EPD&C

FLIGHT:

3/1R

MDAC ID:

1524

ABORT:

3/1R

ITEM:

+28V CONTACT #1

FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- ELECTRICAL 3)
- DISPLAY AND CONTROLS 4)
- **SWITCHES** 5)
- RIGHT AIR DATA PROBE STOW 6)
- ENABLE POSITION 7)

8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	7	RTLS:	3/1R
LIFTOFF:	<i>'</i> /	TAL:	3/1R
ONORBIT:	<i>'</i> /	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	: 3/3		•

REDUNDANCY SCREENS: A [2]

B[F] C[P]

LOCATION:

DISPLAY AND CONTROL PANEL C3

PART NUMBER: ADS.DC.SW.RPS.EN.CN1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD CAUSE UNCOMMANDED

STOWAGE OF PROBE.

7/24/87 HIGHEST CRITICALITY HDW/FUNC DATE: 3/3 SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: ABORT: 3/3 MDAC ID: ITEM: +28V CONTACT #1 FAILURE MODE: FAILS OPEN SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: A.D. MONTGOMERY BREAKDOWN HIERARCHY: MECHANICAL ACTUATION SYSTEM 2) AIR DATA SUBSYSTEM 3) ELECTRICAL DISPLAY AND CONTROLS 4) 5) **SWITCHES** RIGHT AIR DATA PROBE STOW 6) 7) ENABLE POSITION 8) 9) CRITICALITIES HDW/FUNC FLIGHT PHASE HDW/FUNC ABORT 3/3 PRELAUNCH: RTLS: 3/3 TAL: LIFTOFF: AOA: ONORBIT: 3/3 3/3 ATO: DEORBIT: 3/3 LANDING/SAFING: B [] C [] REDUNDANCY SCREENS: A [] DISPLAY AND CONTROL PANEL C3 LOCATION: PART NUMBER: ADS.DC.SW.RPS.EN.CN1 CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD CAUSE FAILURE TO

STOW PROBE.

HIGHEST CRITICALITY HDW/FUNC 7/24/87 DATE: FLIGHT: 3/1R SUBSYSTEM: MECH/ADP/EPD&C ABORT: 3/1R MDAC: ID:

ITEM: +28V CONTACT #2 FAILURE MODE: FAILS SHORTED

SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: A.D. MONTGOMERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- AIR DATA SUBSYSTEM 2)
- ELECTRICAL 3)
- DISPLAY AND CONTROLS 4)
- 5) SWITCHES
- RIGHT AIR DATA PROBE STOW
- ENABLE POSITION 7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	7	RTLS:	3/1R
LIFTOFF:	./	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: DISPLAY AND CONTROL PANEL C3

PART NUMBER: ADS.DC.SW.RPS.EN.CN2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD CAUSE UNCOMMANDED STOWAGE OF PROBE.

HIGHEST CRITICALITY HDW/FUNC 7/24/87 DATE: 3/3 FLIGHT: SUBSYSTEM: MECH/ADP/EPD&C 3/3 ABORT: 1527 MDAC ID: ITEM: +28V CONTACT #2 FAILURE MODE: FAILS OPEN LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM AIR DATA SUBSYSTEM 3) ELECTRICAL DISPLAY AND CONTROLS 4) SWITCHES 5) RIGHT AIR DATA PROBE STOW ENABLE POSITION 8) 9) CRITICALITIES HDW/FUNC FLIGHT PHASE HDW/FUNC ABORT RTLS: 3/3 PRELAUNCH: TAL: 3/3 LIFTOFF: ONORBIT: AOA: 3/3 3/3 ATO: DEORBIT: LANDING/SAFING: 3./3 B [] C [] REDUNDANCY SCREENS: A [] DISPLAY AND CONTROL PANEL C3 LOCATION: PART NUMBER: ADS.DC.SW.RPS.EN.CN2 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD CAUSE FAILURE TO STOW PROBE. REFERENCES:

HIGHEST CRITICALITY HDW/FUNC 7/24/87 DATE: 3/3 MECH/ADP/EPD&C FLIGHT: SUBSYSTEM: ABORT: 3/3 MDAC ID: 1528 CONTACT #1 ITEM: FAILURE MODE: FAILS SHORTED SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: A.D. MONTGOMERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM AIR DATA SUBSYSTEM 2) ELECTRICAL 3) DISPLAY AND CONTROLS 4) 5) SWITCHES RIGHT AIR DATA PROBE STOW 6) INHIBIT POSITION 7) 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE RTLS: 3/3 PRELAUNCH: 3/3 TAL: LIFTOFF: ONORBIT: AOA: 3/3 3/3 ATO: DEORBIT: 3/3 LANDING/SAFING: C [BII REDUNDANCY SCREENS: A [] 1 DISPLAY AND CONTROL PANEL C3 LOCATION: ADS.DC.SW.RPS.IN.CN1 PART NUMBER: CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO EFFECT. REFERENCES:

HIGHEST CRITICALITY HDW/FUNC DATE: 7/24/87 SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: 3/3 3/3 ABORT: MDAC ID: 1529 ITEM: CONTACT #1 FAILURE MODE: FAILS OPEN LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM AIR DATA SUBSYSTEM 2) 3) ELECTRICAL DISPLAY AND CONTROLS 4) **SWITCHES** 5) RIGHT AIR DATA PROBE STOW INHIBIT POSITION 7) 8) 9) CRITICALITIES FLIGHT PHASE HDW/FUNC ABORT HDW/FUNC RTLS: 3/3 PRELAUNCH: 3/3 LIFTOFF: TAL: AOA: ONORBIT: 3/3 3/3 ATO: DEORBIT: LANDING/SAFING: 3/3 REDUNDANCY SCREENS: B [] C [A [] LOCATION: DISPLAY AND CONTROL PANEL C3 PART NUMBER: ADS.DC.SW.RPS.IN.CN1 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO EFFECT.

HIGHEST CRITICALITY HDW/FUNC 7/24/87 DATE: SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: 3/3 3/3 ABORT: MDAC ID: 1530 CONTACT #2 ITEM: FAILURE MODE: FAILS SHORTED SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: A.D. MONTGOMERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) AIR DATA SUBSYSTEM ELECTRICAL 3) DISPLAY AND CONTROLS 4) SWITCHES RIGHT AIR DATA PROBE STOW 6) INHIBIT POSITION 7) 8) 9) CRITICALITIES HDW/FUNC ABORT FLIGHT PHASE HDW/FUNC 3/3 RTLS: PRELAUNCH: / 3/3 TAL: LIFTOFF: AOA: 3/3 ONORBIT: ATO: 3/3 DEORBIT: LANDING/SAFING: 3/3 B[] C[] REDUNDANCY SCREENS: A [] DISPLAY AND CONTROL PANEL C3 LOCATION: PART NUMBER: ADS.DC.SW.RPS.IN.CN2 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO EFFECT.

HIGHEST CRITICALITY HDW/FUNC 7/24/87 DATE: FLIGHT: 3/3 SUBSYSTEM: MECH/ADP/EPD&C 3/3 ABORT: 1531 MDAC ID: ITEM: CONTACT #2 FAILURE MODE: FAILS OPEN LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) AIR DATA SUBSYSTEM 3) ELECTRICAL DISPLAY AND CONTROLS 4) SWITCHES RIGHT AIR DATA PROBE STOW INHIBIT POSITION 7) 8) 9) CRITICALITIES HDW/FUNC FLIGHT PHASE HDW/FUNC ABORT PRELAUNCH: RTLS: 3/3 TAL: 3/3 LIFTOFF: AOA: 3/3 ONORBIT: 3/3 ATO: DEORBIT: LANDING/SAFING: 3/3 B[] C[] REDUNDANCY SCREENS: A [] DISPLAY AND CONTROL PANEL C3 LOCATION: PART NUMBER: ADS.DC.SW.RPS.IN.CN2 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO EFFECT.

HIGHEST CRITICALITY HDW/FUNC DATE: 7/24/87

SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: 3/1R ABORT: 3/1R MDAC ID: 1532

+28V CONTACT #1 ITEM: FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- MECHANICAL ACTUATION SYSTEM 1)
- AIR DATA SUBSYSTEM
- ELECTRICAL 3)
- 4) DISPLAY AND CONTROLS
- **SWITCHES** 5)
- LEFT AIR DATA PROBE 6)
- 7) DEPLOY POSITION

8) 9)

CRITICALITIES

	7212 7 2 7112 7 2 2 2 2		
FLIGHT PHASE H	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	1	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/1R		
•	• • •		

B[F] C[P] REDUNDANCY SCREENS: A [2]

LOCATION: DISPLAY AND CONTROL PANEL C3

PART NUMBER: ADS.DC.SW.LP.DEP.CN1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD CAUSE UNCOMMANDED DEPLOYMENT OF AIR DATA PROBE.

DATE: 7/24/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: 3/1R MDAC ID: 1533 ABORT: 3/1R

ITEM: +28V CONTACT #1

FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAY AND CONTROLS
- 5) SWITCHES
- 6) LEFT AIR DATA PROBE
- 7) DEPLOY POSITION

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	,	RTLS:	3/1R
LIFTOFF:	,	TAL:	3/1R
ONORBIT:	,	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: DISPLAY AND CONTROL PANEL C3

PART NUMBER: ADS.DC.SW.LP.DEP.CN1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT THE PROBE FROM DEPLOYING.

DATE: 7/24/87 HIGHEST CRITICALITY HDW/FUNC SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: 3/1R

MDAC ID: 1534 ABORT: 3/1R

ITEM: +28V CONTACT #2
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAY AND CONTROLS
- 5) SWITCHES
- 6) LEFT AIR DATA PROBE
- 7) DEPLOY POSITION

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	7	RTLS:	3/1R
LIFTOFF:	1	TAL:	3/1R
ONORBIT:	7	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: DISPLAY AND CONTROL PANEL C3

PART NUMBER: ADS.DC.SW.LP.DEP.CN2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD CAUSE UNCOMMANDED

DEPLOYMENT OF AIR DATA PROBE.

DATE: 7/24/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: 3/1R MDAC ID: 1535 ABORT: 3/1R

ITEM: +28V CONTACT #2

FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAY AND CONTROLS
- 5) SWITCHES
- 6) LEFT AIR DATA PROBE
- 7) DEPLOY POSITION

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	,	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING	: 3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: DISPLAY AND CONTROL PANEL C3

PART NUMBER: ADS.DC.SW.LP.DEP.CN2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT THE PROBE

FROM DEPLOYING.

DATE:

7/24/87

HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: MECH/ADP/EPD&C

FLIGHT:

3/1R

MDAC ID:

1536

ABORT:

3/1R

ITEM:

+28V CONTACT #3

FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- MECHANICAL ACTUATION SYSTEM
- AIR DATA SUBSYSTEM 2)
- ELECTRICAL 3)
- DISPLAY AND CONTROLS 4)
- SWITCHES 5)
- LEFT AIR DATA PROBE 6)
- DEPLOY POSITION 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	,	RTLS:	3/1R
LIFTOFF:	<i>'</i> /	TAL:	3/1R
ONORBIT:	,	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
TAMBING (CARING.	ລ້າລ		-

LANDING/SAFING: 3/3

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:

DISPLAY AND CONTROL PANEL C3

PART NUMBER: ADS.DC.SW.LP.DEP.CN3

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD CAUSE UNCOMMANDED DEFLOYMENT OF AIR DATA PROBE.

DATE: 7/24/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: 3/1R MDAC ID: 1537 ABORT: 3/1R

ITEM: +28V CONTACT #3

FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAY AND CONTROLS
- 5) SWITCHES
- 6) LEFT AIR DATA PROBE
- 7) DEPLOY POSITION

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	,	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	,	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: DISPLAY AND CONTROL PANEL C3

PART NUMBER: ADS.DC.SW.LP.DEP.CN3

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT THE PROBE

FROM DEPLOYING.

DATE: 7/24/87 HIGHEST CRITICALITY HDW/FUNC SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: 3/1R

MDAC ID: 1538 ABORT: 3/1R

ITEM: +28V CONTACT #4
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAY AND CONTROLS
- 5) SWITCHES
- 6) LEFT AIR DATA PROBE
- 7) DEPLOY POSITION
- 8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	/	RTLS:	3/1R	
LIFTOFF:	/ .	TAL:	3/1R	
ONORBIT:	,	AOA:	3/1R	
DEORBIT:	3/1R	ATO:	/	
LANDING/SAFING:	3/3		-	

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: DISPLAY AND CONTROL PANEL C3

PART NUMBER: ADS.DC.SW.LP.DEP.CN4

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD CAUSE UNCOMMANDED DEPLOYMENT OF AIR DATA PROBE.

DATE: 7/24/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: 3/1R MDAC ID: 1539 ABORT: 3/1R

ITEM: +28V CONTACT #4

FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAY AND CONTROLS
- 5) SWITCHES
- 6) LEFT AIR DATA PROBE
- 7) DEPLOY POSITION
- 8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	,	TAL:	3/1R
ONORBIT:	./	· AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
T 1 10 THE /C1 DTHE.	o´/o		•

- 1

LANDING/SAFING: 3/3

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: DISPLAY AND CONTROL PANEL C3

PART NUMBER: ADS.DC.SW.LP.DEP.CN4

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT THE PROBE FROM DEPLOYING.

HIGHEST CRITICALITY HDW/FUNC 7/24/87 DATE: FLIGHT: 3/3 SUBSYSTEM: MECH/ADP/EPD&C ABORT: 3/3 1540 MDAC ID: ITEM: +28V CONTACT #1 FAILURE MODE: FAILS SHORTED SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: A.D. MONTGOMERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM AIR DATA SUBSYSTEM 2) 3) ELECTRICAL DISPLAY AND CONTROLS 4) 5) SWITCHES LEFT AIR DATA PROBE 6) DEPLOY/HEAT POSITION 7) 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE PRELAUNCH: RTLS: 3/3 / TAL: 3/3 LIFTOFF: 1 AOA: 3/3 ONORBIT: 3/3 DEORBIT: ATO: / LANDING/SAFING: 3/3 B[] C[] REDUNDANCY SCREENS: A [] DISPLAY AND CONTROL PANEL C3 LOCATION: PART' NUMBER: ADS.DC.SW.LP.DH.CN1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO EFFECT.

DATE:

7/24/87

HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: MECH/ADP/EPD&C

FLIGHT:

3/1R

MDAC ID:

1541

ABORT:

3/1R

ITEM:

+28V CONTACT #1

FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- MECHANICAL ACTUATION SYSTEM
- AIR DATA SUBSYSTEM 2)
- ELECTRICAL 3)
- DISPLAY AND CONTROLS 4)
- 5) SWITCHES
- LEFT AIR DATA PROBE 6)
- 7) DEPLOY/HEAT POSITION

8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	,	TAL:	3/1R
ONORBIT:	,	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/1R		

REDUNDANCY SCREENS: A [2] B [F]

C [P]

LOCATION:

DISPLAY AND CONTROL PANEL C3

PART NUMBER: ADS.DC.SW.LP.DH.CN1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT HEATER OPERATION. THIS COULD RESULT IN ERRONEOUS OR NO AIR DATA REACHING THE ADTAS.

HIGHEST CRITICALITY HDW/FUNC 7/24/87 FLIGHT: 3/3 SUBSYSTEM: MECH/ADP/EPD&C 3/3 ABORT: MDAC ID: 1542 +28V CONTACT #2 ITEM: FAILURE MODE: FAILS SHORTED LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) AIR DATA SUBSYSTEM 3) ELECTRICAL 4) DISPLAY AND CONTROLS 5) SWITCHES 6) LEFT AIR DATA PROBE 7) DEPLOY/HEAT POSITION 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE RTLS: 3/3 TAL: 3/3 AOA: 3/3 ATO: / PRELAUNCH: / LIFTOFF: ONORBIT: 3/3 DEORBIT: LANDING/SAFING: 3/3 REDUNDANCY SCREENS: A [] B [] C [] LOCATION: DISPLAY AND CONTROL PANEL C3 PART NUMBER: ADS.DC.SW.LP.DH.CN2 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO EFFECT. REFERENCES:

HIGHEST CRITICALITY HDW/FUNC 7/24/87 DATE:

3/1R FLIGHT: SUBSYSTEM: MECH/ADP/EPD&C 3/1R ABORT: MDAC ID: 1543

+28V CONTACT #2 ITEM:

FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- DISPLAY AND CONTROLS 4)
- SWITCHES 5)
- LEFT AIR DATA PROBE
- 7) DEPLOY/HEAT POSITION

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	<i>'</i> /	RTLS:	3/1R
LIFTOFF:	<i>'</i> /	TAL:	3/1R
ONORBIT:	1	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/1R		

B[F] C[P] REDUNDANCY SCREENS: A [2]

DISPLAY AND CONTROL PANEL C3 LOCATION:

PART NUMBER: ADS.DC.SW.LP.DH.CN2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT HEATER OPERATION. THIS COULD RESULT IN ERRONEOUS OR NO AIR DATA REACHING THE ADTAS.

HIGHEST CRITICALITY HDW/FUNC DATE: 7/24/87 SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: 3/3 ABORT: 3/3 MDAC ID: 1544 ITEM: +28V CONTACT #3 FAILURE MODE: FAILS SHORTED LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM AIR DATA SUBSYSTEM ELECTRICAL 3) DISPLAY AND CONTROLS 4) SWITCHES 5) LEFT AIR DATA PROBE 6) DEPLOY/HEAT POSITION 7) 8) 9) CRITICALITIES HDW/FUNC FLIGHT PHASE HDW/FUNC ABORT RTLS: 3/3 PRELAUNCH: / TAL: 3/3 LIFTOFF: 1 AOA: ONORBIT: 3/3 3/3 DEORBIT: ATO: / LANDING/SAFING: 3/3 REDUNDANCY SCREENS: A [] B [] C [] LOCATION: DISPLAY AND CONTROL PANEL C3 PART NUMBER: ADS.DC.SW.LP.DH.CN3 CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO EFFECT.

DATE: 7/24/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: 3/1R MDAC ID: 1545 ABORT: 3/1R

ITEM: +28V CONTACT #3

FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAY AND CONTROLS
- 5) SWITCHES
- 6) LEFT AIR DATA PROBE
- 7) DEPLOY/HEAT POSITION

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	./	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	,
LANDING/SAFING:	3/1R	· · · · · · · · · · · · · · · · · · ·	·

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: DISPLAY AND CONTROL PANEL C3

PART NUMBER: ADS.DC.SW.LP.DH.CN3

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT HEATER OPERATION. THIS COULD RESULT IN ERRONEOUS OR NO AIR DATA REACHING THE ADTAS.

HIGHEST CRITICALITY HDW/FUNC 7/24/87 DATE: FLIGHT: 3/3 SUBSYSTEM: MECH/ADP/EPD&C 3/3 ABORT: 1546 MDAC ID: +28V CONTACT #4 ITEM: FAILURE MODE: FAILS SHORTED LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) AIR DATA SUBSYSTEM 3) ELECTRICAL 4) DISPLAY AND CONTROLS SWITCHES 5) LEFT AIR DATA PROBE 6) 7) DEPLOY/HEAT POSITION 8) 9) CRITICALITIES HDW/FUNC HDW/FUNC ABORT FLIGHT PHASE PRELAUNCH: RTLS: 3/3 TAL: 3/3 LIFTOFF: 3/3 AOA: ONORBIT: 3/3 DEORBIT: ATO: LANDING/SAFING: 3/3 B [] C [REDUNDANCY SCREENS: A []] LOCATION: DISPLAY AND CONTROL PANEL C3 PART NUMBER: ADS.DC.SW.LP.DH.CN4

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO EFFECT.

DATE: 7/24/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: 3/1R MDAC ID: 1547 ABORT: 3/1R

ITEM: +28V CONTACT #4

FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAY AND CONTROLS
- 5) SWITCHES
- 6) LEFT AIR DATA PROBE
- 7) DEPLOY/HEAT POSITION

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	,	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	7	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/1R		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: DISPLAY AND CONTROL PANEL C3

PART NUMBER: ADS.DC.SW.LP.DH.CN4

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT HEATER OPERATION. THIS COULD RESULT IN ERRONEOUS OR NO AIR DATA REACHING THE ADTAS.

SUBSYSTEM: MECH/ADP/EPD&C HIGHEST CRITICALITY HDW/FUNC ABORT: 3/1R MDAC: ID: 1548

+28V CONTACT #1 ITEM: FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- ELECTRICAL 3)
- DISPLAY AND CONTROLS 4)
- SWITCHES 5)
- LEFT AIR DATA PROBE 6)
- 7) STOW POSITION
- 8)

9)

CRITICALITIES

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FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	,	RTLS:	3/1R	
LIFTOFF:	7	TAL:	3/1R	
ONORBIT:	/	AOA:	3/1R	
DEORBIT:	3/1R	ATO:	/	
TANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: DISPLAY AND CONTROL PANEL C3

PART NUMBER: ADS.DC.SW.LP.STW.CN1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD CAUSE UNCOMMANDED STOWAGE OF THE PROBE.

HIGHEST CRITICALITY HDW/FUNC DATE: 7/24/87 SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: 3/3 ABORT: 3/3 MDAC ID: 1549 +28V CONTACT #1 ITEM: FAILURE MODE: FAILS OPEN LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM AIR DATA SUBSYSTEM ELECTRICAL 4) DISPLAY AND CONTROLS **SWITCHES** 5) LEFT AIR DATA PROBE STOW POSITION 8) 9) CRITICALITIES HDW/FUNC FLIGHT PHASE HDW/FUNC ABORT / RTLS: 3/3 PRELAUNCH: 3/3 TAL: LIFTOFF: / 3/3 ONORBIT: AOA: DEORBIT: 3/3 ATO: LANDING/SAFING: 3/3 B[] C[] REDUNDANCY SCREENS: A [] DISPLAY AND CONTROL PANEL C3 LOCATION: PART NUMBER: ADS.DC.SW.LP.STW.CN1 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT STOWAGE OF THE PROBE.

DATE:

7/24/87

HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: MECH/ADP/EPD&C

FLIGHT:

3/1R

MDAC: ID:

1550

ABORT:

3/1R

ITEM:

+28V CONTACT #2

FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- DISPLAY AND CONTROLS 4)
- 5) SWITCHES
- LEFT AIR DATA PROBE
- STOW POSITION 7)

8) 9)

CRITICALITIES

HDW/FUNC ABORT

HDW/FUNC

PRELAUNCH: LIFTOFF:

FLIGHT PHASE

RTLS: TAL:

3/1R 3/1R

ONORBIT: DEORBIT:

AOA: ATO: 3/1R

LANDING/SAFING: 3/3

3/1R

REDUNDANCY SCREENS:

A[2] B[F] C[P]

LOCATION:

DISPLAY AND CONTROL PANEL C3

PART NUMBER: ADS.DC.SW.LP.STW.CN2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD CAUSE UNCOMMANDED

STOWAGE OF PROBE.

HIGHEST CRITICALITY HDW/FUNC DATE: 7/24/87 SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: 3/3 ABORT: 3/3 MDAC ID: 1551 +28V CONTACT #2 ITEM: FAILURE MODE: FAILS OPEN LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) AIR DATA SUBSYSTEM 3) ELECTRICAL 4) DISPLAY AND CONTROLS SWITCHES LEFT AIR DATA PROBE 6) 7) STOW POSITION 8) 9) CRITICALITIES HDW/FUNC HDW/FUNC ABORT FLIGHT PHASE / RTLS: 3/3 PRELAUNCH: 3/3 TAL: LIFTOFF: / AOA: 3/3 ONORBIT: DEORBIT: 3/3 ATO: LANDING/SAFING: 3/3 REDUNDANCY SCREENS: A [] B [] C [LOCATION: DISPLAY AND CONTROL PANEL C3 PART NUMBER: ADS.DC.SW.LP.STW.CN2 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT STOWAGE OF THE PROBE.

7/24/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: 3/1R 3/1R ABORT: MDAC ID: 1552

+28V CONTACT #3 ITEM: FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- AIR DATA SUBSYSTEM
- ELECTRICAL 3)
- 4) DISPLAY AND CONTROLS
- 5) SWITCHES
- LEFT AIR DATA PROBE 6)
- STOW POSITION 7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	,	TAL:	3/1R
ONORBIT:	./	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/ -
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: DISPLAY AND CONTROL PANEL C3

PART NUMBER: ADS.DC.SW.LP.STW.CN3

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD CAUSE UNCOMMANDED STOWAGE OF THE PROBE.

HIGHEST CRITICALITY HDW/FUNC DATE: 7/24/87 FLIGHT: 3/3 SUBSYSTEM: MECH/ADP/EPD&C 3/3 ABORT: MDAC ID: 1553 +28V CONTACT #3 ITEM: FAILURE MODE: FAILS OPEN SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: A.D. MONTGOMERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) AIR DATA SUBSYSTEM 3) ELECTRICAL 4) DISPLAY AND CONTROLS 5) SWITCHES 6) LEFT AIR DATA PROBE 7) STOW POSITION 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC
/ RTLS: 3/3
/ TAL: 3/3 FLIGHT PHASE PRELAUNCH: / LIFTOFF: AOA: 3/3 ONORBIT: 3/3 ATO: DEORBIT: _/ LANDING/SAFING: 3/3 REDUNDANCY SCREENS: A [] B [] C [] LOCATION: DISPLAY AND CONTROL PANEL C3 PART NUMBER: ADS.DC.SW.LP.STW.CN3 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT STOWAGE

REFERENCES:

OF THE PROBE.

7/24/87 HIGHEST CRITICALITY HDW/FUNC
SUBSYSTEM: MECH/ADP/EPD&C FITCHING
MDAC ID: 1574 ABORT: 3/1R MDAC ID: 1554

ITEM: +28V CONTACT #4

FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- AIR DATA SUBSYSTEM 2)
- ELECTRICAL 3)
- DISPLAY AND CONTROLS 4)
- 5) SWITCHES
- LEFT AIR DATA PROBE
- STOW POSITION

8) 9)

CRITICALITIES

V			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/1R	and the second of the second o	

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: DISPLAY AND CONTROL PANEL C3

PART NUMBER: ADS.DC.SW.LP.STW.CN4

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD CAUSE UNCOMMANDED

STOWAGE OF PROBE.

HIGHEST CRITICALITY HDW/FUNC 7/24/87 DATE: FLIGHT: 3/3 SUBSYSTEM: MECH/ADP/EPD&C ABORT: 3/3 MDAC ID: 1555 +28V CONTACT #4 ITEM: FAILURE MODE: FAILS OPEN LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM AIR DATA SUBSYSTEM ELECTRICAL 3) DISPLAY AND CONTROLS 4) SWITCHES 5) LEFT AIR DATA PROBE 7) STOW POSITION 8) 9) CRITICALITIES FLIGHT PHASE HDW/FUNC HDW/FUNC ABORT RTLS: 3/3 PRELAUNCH: TAL: 3/3 LIFTOFF: AOA: 3/3 ONORBIT: / 3/3 ATO: DEORBIT: 3/3 LANDING/SAFING: C [REDUNDANCY SCREENS: B [] A [] LOCATION: DISPLAY AND CONTROL PANEL C3 PART NUMBER: ADS.DC.SW.LP.STW.CN4 PIECE-PART STRUCTURAL FAILURE CAUSES: EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT STOWAGE

REFERENCES:

OF PROBE.

DATE: 7/24/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: 3/1R 3/1R MDAC ID: 1556 ABORT:

ITEM: +28V CONTACT #1 FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- ELECTRICAL 3)
- DISPLAY AND CONTROLS 4)
- 5) SWITCHES
- RIGHT AIR DATA PROBE STOW
- ENABLE POSITION 7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

DISPLAY AND CONTROL PANEL C3 LOCATION:

PART NUMBER: ADS.DC.SW.LP.EN.CN1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD CAUSE UNCOMMANDED

STOWAGE OF PROBE.

HIGHEST CRITICALITY HDW/FUNC 7/24/87 DATE: 3/3 SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: 3/3 ABORT: MDAC ID: 1557 ITEM: +28V CONTACT #1 FAILURE MODE: FAILS OPEN SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: A.D. MONTGOMERY BREAKDOWN HIERARCHY: MECHANICAL ACTUATION SYSTEM 1) AIR DATA SUBSYSTEM 2) 3) ELECTRICAL DISPLAY AND CONTROLS 4) 5) **SWITCHES** 6) LEFT AIR DATA PROBE STOW ENABLE POSITION 7) 8) 9) CRITICALITIES HDW/FUNC HDW/FUNC ABORT FLIGHT PHASE RTLS: 3/3 PRELAUNCH: 3/3 LIFTOFF: TAL: ONORBIT: AOA: 3/3 3/3 ATO: DEORBIT: LANDING/SAFING: 3/3 B [C [] REDUNDANCY SCREENS: A []] DISPLAY AND CONTROL PANEL C3 LOCATION: PART NUMBER: ADS.DC.SW.LP.EN.CN1 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD CAUSE FAILURE TO STOW PROBE.

HIGHEST CRITICALITY HDW/FUNC DATE: 7/24/87 SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: 3/1R 3/1R ABORT: MDAC ID: 1558

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+28V CONTACT #2 ITEM: FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- ELECTRICAL 3)
- DISPLAY AND CONTROLS 4)
- 5) SWITCHES
- LEFT AIR DATA PROBE STOW 6)
- ENABLE POSITION 7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	7	RTLS:	3/1R
LIFTOFF:	7	TAL:	3/1R
ONORBIT:	,	AOA:	3/1R
DEORBIT:	3/1R	ATO:	7
LANDING/SAFING:	3/1R		·

REDUNDANCY SCREENS: A [2] B [F] C [P]

DISPLAY AND CONTROL PANEL C3 LOCATION:

PART NUMBER: ADS.DC.SW.LP.EN.CN2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD CAUSE UNCOMMANDED

STOWAGE OF PROBE.

HIGHEST CRITICALITY HDW/FUNC 7/24/87 DATE: 3/3 SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: 3/3 ABORT: MDAC ID: 1559 ITEM: +28V CONTACT #2 FAILURE MODE: FAILS OPEN LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM AIR DATA SUBSYSTEM ELECTRICAL 3) DISPLAY AND CONTROLS 4) 5) **SWITCHES** LEFT AIR DATA PROBE STOW 6) ENABLE POSITION 7) 8) 9) CRITICALITIES HDW/FUNC FLIGHT PHASE HDW/FUNC ABORT PRELAUNCH: RTLS: 3/3 TAL: 3/3 LIFTOFF: AOA: ONORBIT: 3/3 ATO: DEORBIT: 3/3 LANDING/SAFING: 3/3 REDUNDANCY SCREENS: A [] B [] C [] LOCATION: DISPLAY AND CONTROL PANEL C3 PART NUMBER: ADS.DC.SW.LP.EN.CN2 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD CAUSE FAILURE TO

REFERENCES:

STOW PROBE.

DATE: 7/24/87 SUBSYSTEM: MECH/ADP/EPD&C MDAC ID: 1560	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: 3/3
ITEM: CONTACT #1 FAILURE MODE: FAILS SHORTED	
LEAD ANALYST: A.D. MONTGOMERY	SUBSYS LEAD: H.J. LOWERY
BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) AIR DATA SUBSYSTEM 3) ELECTRICAL 4) DISPLAY AND CONTROLS 5) SWITCHES 6) LEFT AIR DATA PROBE STOW 7) INHIBIT POSITION 8) 9)	
CRITICAL	LITIES
FLIGHT PHASE HDW/FUNC PRELAUNCH: / LIFTOFF: / ONORBIT: / DEORBIT: 3/3 LANDING/SAFING: 3/3	ABORT HDW/FUNC RTLS: 3/3 TAL: 3/3 AOA: 3/3 ATO: /
REDUNDANCY SCREENS: A []	B [] C []
LOCATION: DISPLAY AND CONTROL PART NUMBER: ADS.DC.SW.LP.IN.CN1	PANEL C3
CAUSES: PIECE-PART STRUCTURAL FAIR	LURE
EFFECTS/RATIONALE: NO EFFECT.	
REFERENCES:	

7/24/87 HIGHEST CRITICALITY HDW/FUNC DATE: FLIGHT: 3/3 SUBSYSTEM: MECH/ADP/EPD&C 3/3 ABORT: 1561 MDAC ID: CONTACT #1 ITEM: FAILURE MODE: FAILS OPEN LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM AIR DATA SUBSYSTEM 2) 3) ELECTRICAL 4) DISPLAY AND CONTROLS SWITCHES LEFT AIR DATA PROBE STOW 6) INHIBIT POSITION 7) 8) 9) CRITICALITIES HDW/FUNC FLIGHT PHASE HDW/FUNC ABORT PRELAUNCH: / RTLS: 3/3 TAL: 3/3 LIFTOFF: AOA: 3/3 ONORBIT: 3/3 ATO: DEORBIT: LANDING/SAFING: 3/3 C [] A[] B[] REDUNDANCY SCREENS: DISPLAY AND CONTROL PANEL C3 LOCATION: PART NUMBER: ADS.DC.SW.LP.IN.CN1 CAUSES: PIECE-PART STRUCTURAL FAILURE

REFERENCES:

NO EFFECT.

EFFECTS/RATIONALE:

HIGHEST CRITICALITY 7/24/87 HDW/FUNC DATE: SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: 3/3 ABORT: 3/3 MDAC ID: 1562 ITEM: CONTACT #2 FAILURE MODE: FAILS SHORTED LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM AIR DATA SUBSYSTEM 2) ELECTRICAL 3) DISPLAY AND CONTROLS 4) 5) SWITCHES LEFT AIR DATA PROBE STOW 6) 7) INHIBIT POSITION 8) 9) CRITICALITIES FLIGHT PHASE HDW/FUNC ABORT HDW/FUNC 3/3 PRELAUNCH: RTLS: 3/3 LIFTOFF: TAL: ONORBIT: AOA: 3/3 3/3 DEORBIT: ATO: LANDING/SAFING: 3/3 B[] C[] REDUNDANCY SCREENS: A [] LOCATION: DISPLAY AND CONTROL PANEL C3 PART NUMBER: ADS.DC.SW.LP.IN.CN2 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO EFFECT.

HIGHEST CRITICALITY HDW/FUNC 7/24/87 DATE: FLIGHT: 3/3 SUBSYSTEM: MECH/ADP/EPD&C 3/3 ABORT: MDAC ID: 1563 ITEM: CONTACT #2 FAILURE MODE: FAILS OPEN LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: MECHANICAL ACTUATION SYSTEM 2) AIR DATA SUBSYSTEM ELECTRICAL 3) DISPLAY AND CONTROLS 4) SWITCHES 5) LEFT AIR DATA PROBE STOW 6) INHIBIT POSITION 7) 8) 9) CRITICALITIES FLIGHT PHASE HDW/FUNC ABORT HDW/FUNC 3/3 RTLS: PRELAUNCH: TAL: 3/3 LIFTOFF: AOA: 3/3 ONORBIT: 3/3 ATO: DEORBIT: / LANDING/SAFING: 3/3 A[] B[] C[] REDUNDANCY SCREENS: DISPLAY AND CONTROL PANEL C3 LOCATION: PART NUMBER: ADS.DC.SW.LP.IN.CN2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO EFFECT.

SUBSYSTEM: MECH/ADP/EPD&C FITCUM-ABORT: 3/1R MDAC ID: 1564 INVERTED AND GATE ITEM: FAILURE MODE: FAILS SHORTED LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) AIR DATA SUBSYSTEM ELECTRICAL 3) MOTOR CONTROL ASSEMBLY 4) DEPLOY #1 5) 6) 7) 8) 9) CRITICALITIES
HDW/FUNC ABORT FLIGHT PHASE HDW/FUNC RTLS: 3/1R / PRELAUNCH: 3/1R LIFTOFF: TAL: ONORBIT: AOA: 3/1R 3/1R ATO: . / DEORBIT: LANDING/SAFING: 3/3 REDUNDANCY SCREENS: A [2] B [F] C [P] LOCATION: FORWARD AVIONICS BAYS PART NUMBER: ADS.MCA.DE1.IAG CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD CAUSE UNCOMMANDED PROBE DEPLOYMENT.

HIGHEST CRITICALITY HDW/FUNC 7/31/87 DATE: FLIGHT: 3/1R SUBSYSTEM: MECH/ADP/EPD&C

3/1R ABORT: MDAC ID: 1565

INVERTED AND GATE ITEM:

FAILURE MODE: FAILS OPEN

SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: A.D. MONTGOMERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) MOTOR CONTROL ASSEMBLY
- 5) DEPLOY #1
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

HDW/FUNC	ABORT	HDW/FUNC
,	RTLS:	3/1R
./	TAL:	3/1R
,	AOA:	3/1R
3/1R	ATO:	/
3/3		
	/ / / 3/1R	/ RTLS: / TAL: / AOA: 3/1R ATO:

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: FORWARD AVIONICS BAYS

PART NUMBER: ADS.MCA.DE1.IAG

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT

DEPLOYMENT OF THE PROBE.

HIGHEST CRITICALITY HDW/FUNC DATE: 7/31/87 SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: 3/1R ABORT: 3/1R MDAC ID: 1566 INVERTED AND GATE ITEM: FAILURE MODE: FAILS SHORTED LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: MECHANICAL ACTUATION SYSTEM 1) AIR DATA SUBSYSTEM 2) ELECTRICAL 3) MOTOR CONTROL ASSEMBLY 4) DEPLOY #2 5) 6) 7) 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE PRELAUNCH: RTLS: 3/1R 3/1R LIFTOFF: TAL: 3/1R AOA: ONORBIT: 3/1R ATO: DEORBIT: LANDING/SAFING: 3/3 REDUNDANCY SCREENS: A [2] B [F] C [P] FORWARD AVIONICS BAYS LOCATION: PART NUMBER: ADS.MCA.DE2.IAG CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD CAUSE UNCOMMANDED

REFERENCES:

PROBE DEPLOYMENT.

HIGHEST CRITICALITY HDW/FUNC 7/31/87 DATE: FLIGHT: 3/1R SUBSYSTEM: MECH/ADP/EPD&C 3/1R ABORT: MDAC ID: 1567 INVERTED AND GATE ITEM: FAILURE MODE: FAILS OPEN LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM AIR DATA SUBSYSTEM 2) 3) ELECTRICAL 4) MOTOR CONTROL ASSEMBLY DEPLOY #2 5) 6) 7) 8)

CRITICALITIES HDW/FUNC FLIGHT PHASE HDW/FUNC ABORT 3/1R PRELAUNCH: RTLS: / 3/1R TAL: LIFTOFF: 3/1R AOA: ONORBIT: 3/1R DEORBIT: ATO: /

LANDING/SAFING: 3/3

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: FORWARD AVIONICS BAYS

PART NUMBER: ADS.MCA.DE2.IAG

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT

DEPLOYMENT OF THE PROBE.

REFERENCES:

9)

HIGHEST CRITICALITY HDW/FUNC 7/31/87 DATE: 3/1R SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: ABORT: 3/1R MDAC ID: 1568 INVERTED AND GATE ITEM: FAILURE MODE: FAILS SHORTED SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: A.D. MONTGOMERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM AIR DATA SUBSYSTEM 3) ELECTRICAL MOTOR CONTROL ASSEMBLY 4) STOW #1 5) 6) 7) 8) 9) CRITICALITIES RTLS: 3/1R HDW/FUNC ABORT FLIGHT PHASE PRELAUNCH: LIFTOFF: AOA: 3/1R ONORBIT: 3/1R ATO: DEORBIT: LANDING/SAFING: 3/3 REDUNDANCY SCREENS: A [2] B [F] C [P]

FORWARD AVIONICS BAYS LOCATION: PART NUMBER: ADS.MCA.ST1.IAG

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT SUBSEQUENT FAILURES COULD CAUSE UNCOMMANDED

STOWAGE OF PROBE.

HIGHEST CRITICALITY HDW/FUNC DATE: 7/31/87 3/3 FLIGHT: SUBSYSTEM: MECH/ADP/EPD&C 3/3 ABORT: MDAC ID: INVERTED AND GATE ITEM: FAILURE MODE: FAILS OPEN SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: A.D. MONTGOMERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) AIR DATA SUBSYSTEM 3) ELECTRICAL MOTOR CONTROL ASSEMBLY 4) STOW #1 5) 6) 7) 8) 9) CRITICALITIES HDW/FUNC HDW/FUNC FLIGHT PHASE ABORT RTLS: 3/3 PRELAUNCH: TAL: 3/3 LIFTOFF: 3/3 AOA: ONORBIT: 3/3 ATO: DEORBIT: LANDING/SAFING: 3/3 REDUNDANCY SCREENS: A [] B [] C [LOCATION: FORWARD AVIONICS BAYS PART NUMBER: ADS.MCA.ST1.IAG CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT SUBSEQUENT FAILURES COULD PREVENT STOWING THE PROBE.

DATE: 7/31/87 HIGHEST CRITICALITY HDW/FUNC SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: 3/1R MDAC ID: 1570 ABORT: 3/1R

ITEM: INVERTED AND GATE FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) MOTOR CONTROL ASSEMBLY
- 5) STOW #2
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	: 3/3		المربيط المجلحة

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: FORWARD AVIONICS BAYS

PART NUMBER: ADS.MCA.ST2.IAG

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT SUBSEQUENT FAILURES COULD CAUSE UNCOMMANDED STOWAGE OF PROBE.

HIGHEST CRITICALITY HDW/FUNC 7/31/87 DATE: 3/3 FLIGHT: SUBSYSTEM: MECH/ADP/EPD&C ABORT: 3/3 MDAC ID: 1571 INVERTED AND GATE ITEM: FAILURE MODE: FAILS OPEN LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) AIR DATA SUBSYSTEM 3) ELECTRICAL 4) MOTOR CONTROL ASSEMBLY STOW #2 5) 6) 7) 8) 9) CRITICALITIES FLIGHT PHASE HDW/FUNC ABORT HDW/FUNC RTLS: 3/3 PRELAUNCH: / 3/3 TAL: LIFTOFF: 1 AOA: 3/3 ONORBIT: 3/3 ATO: DEORBIT: LANDING/SAFING: 3/3 REDUNDANCY SCREENS: A [] B [] C [] LOCATION: FORWARD AVIONICS BAYS PART NUMBER: ADS.MCA.ST2.IAG CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT SUBSEQUENT FAILURES COULD PREVENT STOWAGE OF PROBE.

HIGHEST CRITICALITY HOW/FUNC 7/31/87 DATE: FLIGHT: 3/1R SUBSYSTEM: MECH/ADP/EPD&C ABORT: 3/1R MDAC ID: 1572 ITEM: RELAY DRIVER FAILURE MODE: FAILS SHORTED LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: MECHANICAL ACTUATION SYSTEM AIR DATA SUBSYSTEM 2) ELECTRICAL 3) MOTOR CONTROL ASSEMBLY 4) DEPLOY #1 6) 7) 8) 9) CRITICALITIES HDW/FUNC ABORT FLIGHT PHASE HDW/FUNC / RTLS: 3/1R PRELAUNCH: 3/1R LIFTOFF: / TAL: ONORBIT: AOA: 3/1R 3/1R ATO: DEORBIT: LANDING/SAFING: 3/3 REDUNDANCY SCREENS: A [2] B[F] C[P] FORWARD AVIONICS BAYS LOCATION: PART NUMBER: ADS.MCA.DE1.RD CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT SUBSEQUENT FAILURES COULD CAUSE UNCOMMANDED PROBE DEPLOYMENT.

HIGHEST CRITICALITY HDW/FUNC DATE: 7/31/87 SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: 3/1R 3/1R MDAC ID: 1573 ABORT: RELAY DRIVER ITEM: FAILURE MODE: FAILS OPEN SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: A.D. MONTGOMERY BREAKDOWN HIERARCHY: MECHANICAL ACTUATION SYSTEM 1) 2) AIR DATA SUBSYSTEM ELECTRICAL 3) MOTOR CONTROL ASSEMBLY 4) DEPLOY #1 5) 6) 7) 8) 9) CRITICALITIES HDW/FUNC FLIGHT PHASE HDW/FUNC ABORT PRELAUNCH: 3/1R RTLS: LIFTOFF: TAL: 3/1R ONORBIT: AOA: 3/1R DEORBIT: 3/1R ATO: LANDING/SAFING: 3/1R A [2] B [F] C [P] REDUNDANCY SCREENS: LOCATION: FORWARD AVIONICS BAYS PART NUMBER: ADS.MCA.DE1.RD CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT

DEPLOYMENT OF THE PROBE.

HIGHEST CRITICALITY HDW/FUNC 7/31/87 DATE: SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: 3/1R 3/1R ABORT: MDAC ID: 1574 ITEM: RELAY DRIVER FAILURE MODE: FAILS SHORTED LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM AIR DATA SUBSYSTEM 2) 3) ELECTRICAL 4) MOTOR CONTROL ASSEMBLY 5) DEPLOY #2 6) 7) 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE RTLS: TAL: AOA: / 3/1R PRELAUNCH: 7 LIFTOFF: 3/1R 3/1R ONORBIT: DEORBIT: 3/1R ATO: LANDING/SAFING: 3/3 REDUNDANCY SCREENS: A [2] B [F] C [P] FORWARD AVIONICS BAYS LOCATION: PART NUMBER: ADS.MCA.DE2.RD CAUSES: PIECE-PART STRUCTURAL FAILURE

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD CAUSE UNCOMMANDED

PROBE DEPLOYMENT.

EFFECTS/RATIONALE:

HIGHEST CRITICALITY HDW/FUNC 7/31/87 DATE: 3/1R FLIGHT: SUBSYSTEM: MECH/ADP/EPD&C 3/1R ABORT: MDAC ID: 1575 ITEM: RELAY DRIVER FAILURE MODE: FAILS OPEN SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: A.D. MONTGOMERY BREAKDOWN HIERARCHY: MECHANICAL ACTUATION SYSTEM 2) AIR DATA SUBSYSTEM ELECTRICAL 3) MOTOR CONTROL ASSEMBLY 4) DEPLOY #2 5) 6) 7) 8) 9) CRITICALITIES ABORT HDW/FUNC FLIGHT PHASE HDW/FUNC RTLS: 3/1R PRELAUNCH: 3/1R TAL: LIFTOFF: AOA: 3/1R ONORBIT:

REDUNDANCY SCREENS: A [2] B [F] C [P]

3/1R

LOCATION: FORWARD AVIONICS BAYS

LANDING/SAFING: 3/3

PART NUMBER: ADS.MCA.DE2.RD

DEORBIT:

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREENT DEPLOYMENT

ATO:

OF THE PROBE.

HIGHEST CRITICALITY HDW/FUNC 7/31/87 DATE: SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: 3/1R 1576 ABORT: 3/1R MDAC ID:

ITEM: RELAY DRIVER FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) MOTOR CONTROL ASSEMBLY
- STOW #1 5)
- 6)
- 7) 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	/	RTLS:	3/1R	
LIFTOFF:	/	TAL:	3/1R	
ONORBIT:	/	AOA:	3/1R	
DEORBIT:	3/1R	ATO:	/	
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [2] B [F] C [P]

FORWARD AVIONICS BAYS LOCATION:

PART NUMBER: ADS.MCA.ST1.RD

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD CAUSE UNCOMMANDED

STOWAGE OF PROBE.

HIGHEST CRITICALITY HDW/FUNC 7/31/87 DATE: 3/3 FLIGHT: SUBSYSTEM: MECH/ADP/EPD&C 3/3 ABORT: MDAC ID: 1577 ITEM: RELAY DRIVER FAILURE MODE: FAILS OPEN LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) AIR DATA SUBSYSTEM ELECTRICAL 3) MOTOR CONTROL ASSEMBLY 4) STOW #1 5) 6) 7) 8) 9) CRITICALITIES FLIGHT PHASE HDW/FUNC ABORT HDW/FUNC 3/3 RTLS: PRELAUNCH: TAL: 3/3 LIFTOFF: . / AOA: 3/3 ONORBIT: 3/3 ATO: DEORBIT: LANDING/SAFING: 3/3 C [] REDUNDANCY SCREENS: A [] B [] FORWARD AVIONICS BAYS LOCATION: PART NUMBER: ADS.MCA.ST1.RD CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT STOWAGE OF PROBE.

DATE: 7/31/87 HIGHEST CRITICALITY HDW/FUNC SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: 3/1R MDAC ID: 1578 ABORT: 3/1R

ITEM: RELAY DRIVER FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) MOTOR CONTROL ASSEMBLY
- 5) STOW #2
- 6)
- 7)
- 8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	1	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: FORWARD AVIONICS BAYS

PART NUMBER: ADS.MCA.ST2.RD

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD CAUSE UNCOMMANDED STOWAGE OF PROBE.

DATE: 7/31/87 SUBSYSTEM: MECH/ADP/EPD&C MDAC ID: 1579	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: 3/3
ITEM: RELAY DRIVER FAILURE MODE: FAILS OPEN	
LEAD ANALYST: A.D. MONTGOMERY	SUBSYS LEAD: H.J. LOWERY
BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) AIR DATA SUBSYSTEM 3) ELECTRICAL 4) MOTOR CONTROL ASSEMBLY 5) STOW #2 6) 7) 8) 9)	
CRITICAL	ITIES
FLIGHT PHASE HDW/FUNC PRELAUNCH: / LIFTOFF: / ONORBIT: / DEORBIT: 3/3 LANDING/SAFING: 3/3	ABORT HDW/FUNC RTLS: 3/3 TAL: 3/3 AOA: 3/3 ATO: /
REDUNDANCY SCREENS: A []	в[] с[]
LOCATION: FORWARD AVIONICS BAYS PART NUMBER: ADS.MCA.ST2.RD	
CAUSES: PIECE-PART STRUCTURAL FAIL	URE
EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FA OF PROBE.	ILURES COULD PREVENT STOWAGE
REFERENCES:	

HIGHEST CRITICALITY HDW/FUNC 7/31/87 DATE: FLIGHT: 3/1R SUBSYSTEM: MECH/ADP/EPD&C ABORT: 3/1R 1580 MDAC ID: RELAY ITEM: FAILURE MODE: FAILS SHORTED LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: MECHANICAL ACTUATION SYSTEM 1) 2) AIR DATA SUBSYSTEM 3) ELECTRICAL MOTOR CONTROL ASSEMBLY 4) DEPLOY #1 6) 7) 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE RTLS: 3/1R PRELAUNCH: 3/1R LIFTOFF: TAL: 3/1R AOA: ONORBIT: 3/1R ATO: DEORBIT: LANDING/SAFING: 3/3

A[2] B[F] C[P] REDUNDANCY SCREENS:

FORWARD AVIONICS BAYS LOCATION:

PART NUMBER: ADS.MCA.DE1.RLY

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD CAUSE UNCOMMANDED

PROBE DEPLOYMENT.

DATE: 7/31/87 HIGHEST CRITICALITY HDW/FUNC SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: 3/1R MDAC ID: 1581 ABORT: 3/1R

ITEM:

RELAY

FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) MOTOR CONTROL ASSEMBLY
- 5) DEPLOY #1

6)

7)

8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	,	RTLS:	3/1R
LIFTOFF:	<i>'</i> / .	TAL:	3/1R
ONORBIT:	7	AOA:	3/1R
DEORBIT:	3/1R	ATO:	,
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: FORWARD AVIONICS BAYS

PART NUMBER: ADS.MCA.DE1.RLY

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT

DEPLOYMENT OF THE PROBE.

HIGHEST CRITICALITY HDW/FUNC 7/31/87 DATE: FLIGHT: 3/1R SUBSYSTEM: MECH/ADP/EPD&C

ABORT: 3/1R 1582 MDAC ID:

RELAY ITEM:

FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

MECHANICAL ACTUATION SYSTEM 1)

AIR DATA SUBSYSTEM 2)

3) ELECTRICAL

4) MOTOR CONTROL ASSEMBLY

DEPLOY #2 5)

6)

7)

8) 9)

CRITICALITIES

HDW/FUNC ABORT HDW/FUNC RTLS: 3/1R FLIGHT PHASE PRELAUNCH: TAL: 3/1R LIFTOFF: AOA: 3/1R ONORBIT: 3/1R ATO: DEORBIT: LANDING/SAFING: 3/3

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: FORWARD AVIONICS BAYS

PART NUMBER: ADS.MCA.DE2.RLY

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD CAUSE UNCOMMANDED

PROBE DEPLOYMENT.

DATE: 7/31/87 HIGHEST CRITICALITY HDW/FUNC SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: 3/1R

MDAC ID: 1583 ABORT: 3/1R

ITEM: RELAY

FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) MOTOR CONTROL ASSEMBLY
- 5) DEPLOY #2
- 6)
- 7)
- 8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	7	RTLS:	3/1R
LIFTOFF:	1	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/ .
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: FORWARD AVIONICS BAYS

PART NUMBER: ADS.MCA.DE2.RLY

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT

DEPLOYMENT OF THE PROBE.

HIGHEST CRITICALITY HDW/FUNC 7/31/87 DATE: FLIGHT: 3/1R SUBSYSTEM: MECH/ADP/EPD&C ABORT: 3/1R MDAC ID: 1584 RELAY ITEM: FAILURE MODE: FAILS SHORTED SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: A.D. MONTGOMERY BREAKDOWN HIERARCHY: MECHANICAL ACTUATION SYSTEM 1) AIR DATA SUBSYSTEM ELECTRICAL 3) MOTOR CONTROL ASSEMBLY 4) STOW #1 6) 7) 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE RTLS: 3/1R PRELAUNCH: / 3/1R TAL: LIFTOFF: 3/1R ONORBIT: AOA: 3/1R DEORBIT: ATO: LANDING/SAFING: 3/3 REDUNDANCY SCREENS: A [2] B [F] C [P]

FORWARD AVIONICS BAYS LOCATION:

PART NUMBER: ADS.MCA.ST1.RLY

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD CAUSE UNCOMMANDED

STOWAGE OF PROBE.

HIGHEST CRITICALITY HDW/FUNC 7/31/87 DATE: SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: 3/3 3/3 MDAC ID: 1585 ABORT: RELAY ITEM: FAILURE MODE: FAILS OPEN LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) AIR DATA SUBSYSTEM 3) ELECTRICAL 4) MOTOR CONTROL ASSEMBLY STOW #1 5) 6) 7) 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE PRELAUNCH: RTLS: 3/3 TAL: 3/3 LIFTOFF: AOA: 3/3 ONORBIT: 3/3 ATO: DEORBIT: LANDING/SAFING: 3/3 REDUNDANCY SCREENS: A [] B [] C [] LOCATION: FORWARD AVIONICS BAYS PART NUMBER: ADS.MCA.ST1.RLY CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT STOWAGE OF PROBE.

HIGHEST CRITICALITY HDW/FUNC DATE: 7/31/87 FLIGHT: 3/1R MECH/ADP/EPD&C SUBSYSTEM: 3/1R ABORT: 1586 MDAC ID: ITEM: RELAY FAILURE MODE: FAILS SHORTED LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: MECHANICAL ACTUATION SYSTEM 1) AIR DATA SUBSYSTEM 2) ELECTRICAL 3) MOTOR CONTROL ASSEMBLY 4) 5) STOW #2 6) 7) 8) 9) CRITICALITIES FLIGHT PHASE HDW/FUNC ABORT HDW/FUNC 3/1R RTLS: PRELAUNCH: LIFTOFF: TAL: 3/1R 3/1R ONORBIT: AOA: 3/1R ATO: DEORBIT: LANDING/SAFING: 3/3 REDUNDANCY SCREENS: A[2] B[F] C[P] LOCATION: FORWARD AVIONICS BAYS PART NUMBER: ADS.MCA.ST2.RLY CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: SUBSEQUENT FAILURES COULD CAUSE UNCOMMANDED NO IMMEDIATE EFFECT. STOWAGE OF PROBE. REFERENCES:

DATE: 7/31/87 SUBSYSTEM: MECH/ADP/EPD&C MDAC ID: 1587	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: 3/3
ITEM: RELAY FAILURE MODE: FAILS SHORTED	
LEAD ANALYST: A.D. MONTGOMERY	SUBSYS LEAD: H.J. LOWERY
BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) AIR DATA SUBSYSTEM 3) ELECTRICAL 4) MOTOR CONTROL ASSEMBLY 5) STOW #2 6) 7) 8) 9)	
CRITICAL	ITIES
FLIGHT PHASE HDW/FUNC PRELAUNCH: / LIFTOFF: / ONORBIT: / DEORBIT: 3/3 LANDING/SAFING: 3/3	ABORT HDW/FUNC RTLS: 3/3 TAL: 3/3 AOA: 3/3 ATO: /
REDUNDANCY SCREENS: A []	в[] с[]
LOCATION: FORWARD AVIONICS BAYS PART NUMBER: ADS.MCA.ST2.RLY	
CAUSES: PIECE-PART STRUCTURAL FAIL	URE
EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FA OF PROBE.	ILURES COULD PREVENT STOWAGE
REFERENCES:	

DATE: 7/31/87 SUBSYSTEM: MECH/ADP/ MDAC ID: 1588	EPD&C		TICALITY FLIGHT: ABORT:	3/3 3/3
ITEM: AND GA FAILURE MODE: FAILS			×	
LEAD ANALYST: A.D. MO	NTGOMERY	SUBSYS LEA	D: H.J. LO	WERY
BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUA 2) AIR DATA SUBSYST 3) ELECTRICAL 4) HEATER CONTROL A 5) 6) 7) 8)	EM			
	CRITICAL	TIES		
FLIGHT PHASE PRELAUNCH: LIFTOFF: ONORBIT: DEORBIT: LANDING/SAFING	HDW/FUNC / / 3/3 : 3/3	ABORT RTLS: TAL: AOA: ATO:	3/3	c
REDUNDANCY SCREENS:	A [] I	3 []	c []	
LOCATION: FORWARD PART NUMBER: ADS.HCA				
CAUSES: PIECE-PART S' EFFECTS/RATIONALE: NO EFFECT.				

DATE: 7/31/87 HIGHEST CRITICALITY HDW/FUNC SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: 3/1R

SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: 3/1R MDAC ID: 1589 ABORT: 3/1R

ITEM: AND GATE FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) HEATER CONTROL ASSEMBLY

5)

6)

7)

8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	1	RTLS:	3/1R
LIFTOFF:	,	TAL:	3/1R
ONORBIT:	,	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: FORWARD AVIONICS BAYS

PART NUMBER: ADS.HCA.AG

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT HEATER OPERATION. THIS COULD RESULT IN ERRONEOUS OR NO AIR DATA REACHING THE ADTAS.

DATE: 7/31/87 SUBSYSTEM: MECH/ADP/EPD&C MDAC ID: 1590	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: 3/3
ITEM: TIME DELAY FAILURE MODE: FAILS SHORTED	
LEAD ANALYST: A.D. MONTGOMERY	SUBSYS LEAD: H.J. LOWERY
BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTE 2) AIR DATA SUBSYSTEM 3) ELECTRICAL 4) HEATER CONTROL ASSEMBLY 5) 6) 7) 8) 9)	MENTER BETTE (M. 1888).
CPIT	CICALITIES
FLIGHT PHASE HDW/FUNC PRELAUNCH: / LIFTOFF: / ONORBIT: / DEORBIT: 3/3 LANDING/SAFING: 3/3	
REDUNDANCY SCREENS: A []	B [] C []
LOCATION: FORWARD AVIONICS PART NUMBER: ADS.HCA.TD	BAYS
CAUSES: PIECE-PART STRUCTURAL	FAILURE
EFFECTS/RATIONALE:	

DATE: 7/31/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: 3/1R MDAC ID: 1591 ABORT: 3/1R

ITEM: TIME DELAY FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) HEATER CONTROL ASSEMBLY

5)

6)

7)

8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	,	RTLS:	3/1R
LIFTOFF:	7	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: FORWARD AVIONICS BAYS

PART NUMBER: ADS.HCA.TD

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT HEATER OPERATION. THIS COULD RESULT IN ERRONEOUS OR NO AIR DATA REACHING THE ADTAS.

		*					' - ' ' - ' - ' - ' - ' - ' -	
DATE: SUBSYST MDAC ID	EM: ME0	7/31/87 CH/ADP/I 92	EPD&C			F	TICALITY LIGHT: BORT:	HDW/FUNC 3/3 3/3
ITEM: FAILURE	MODE:	SOLID S	STATE I	DRIVER D			: 4-	
LEAD AN	ALYST: A	A.D. MON	NTGOME	RY	SUBS	YS LEAD	: H.J. L	OWERY
1) ME 2) AI 3) EL	WN HIERA CHANICA R DATA S ECTRICA ATER CO	L ACTUAT SUBSYSTI L	EM					
				CRITICAL	ITTES			
	GHT PHAS PRELAUNG LIFTOFF ONORBIT DEORBIT LANDING	;	HDW/F7	UNC	ABO	ORT RTLS: TAL: AOA: ATO:	HDW/FUN 3/3 3/3 3/3 /	ic
REDUNDA	NCY SCRI	eens:	A [1	В []	c []	
	N: I MBER: 2			ICS BAYS				
	/RATION		TRUCTU	RAL FAIL	URE .			
-	-							

DATE: 7/31/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: 3/1R MDAC ID: 1593 ABORT: 3/1R

ITEM: SOLID STATE DRIVER

FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) HEATER CONTROL ASSEMBLY

5)

6)

7)

8) 9)

CRITICALITIES

HDW/FUNC HDW/FUNC ABORT FLIGHT PHASE PRELAUNCH: RTLS: 3/1R LIFTOFF: TAL: 3/1R 3/1R AOA: ONORBIT: 3/1R ATO: DEORBIT: LANDING/SAFING: 3/3

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: FORWARD AVIONICS BAYS

PART NUMBER: ADS.HCA.SSD

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT HEATER OPERATION. THIS COULD RESULT IN ERRONEOUS OR NO AIR DATA REACHING THE ADTAS.

DATE: 7/31/87 SUBSYSTEM: MECH/ADP/EPD&C MDAC ID: 1594		HIGHE	FL	ICALITY IGHT: ORT:	HDW/FUNC 3/3 3/3
ITEM: REMOTE POWER FAILURE MODE: FAILS SHORTE		LER		H - 뜻로 동차 기하당	
LEAD ANALYST: A.D. MONTGOME	RY	SUBSYS	S LEAD:	H.J. L	OWERY
BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION S 2) AIR DATA SUBSYSTEM 3) ELECTRICAL 4) HEATER CONTROL ASSEMBL 5) 320W HEATER 6) 7) 8) 9)					
	CRITICAL	ITIES			
	UNC	ABOI	RT RTLS: FAL: AOA: ATO:	HDW/FU 3/3 3/3 3/3 /	NC .
REDUNDANCY SCREENS: A []	в[]]	c []	
LOCATION: FORWARD AVION PART NUMBER: ADS.HCA.RPC	ICS BAYS				
CAUSES: PIECE-PART STRUCTU	RAL FAIL	ÜRE			
EFFECTS/RATIONALE: NO EFFECT.					

DATE: 7/31/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: 3/1R MDAC ID: 1595 ABORT: 3/1R

ITEM: REMOTE POWER CONTROLLER

FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) HEATER CONTROL ASSEMBLY
- 5) 320W HEATER

6) 7\

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	,	RTLS:	3/1R
LIFTOFF:	7	TAL:	3/1R
ONORBIT:	,	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/1R		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: FORWARD AVIONICS BAYS

PART NUMBER: ADS.HCA.RPC

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT HEATER OPERATION. THIS COULD RESULT IN ERRONEOUS OR NO AIR DATA REACHING THE ADTAS.

DATE: 7/31/87 SUBSYSTEM: MECH/ADP/EPD&C MDAC ID: 1596	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: 3/3
ITEM: REMOTE POWER CONTROL FAILURE MODE: FAILS SHORTED	LER
LEAD ANALYST: A.D. MONTGOMERY	SUBSYS LEAD: H.J. LOWERY
BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) AIR DATA SUBSYSTEM 3) ELECTRICAL 4) HEATER CONTROL ASSEMBLY 5) 270W HEATER 6) 7) 8) 9)	
CRITICAL	ITIES
FLIGHT PHASE HDW/FUNC	ABORT HDW/FUNC
PRELAUNCH: /	RTLS: 3/3
LIFTOFF: /	TAL: 3/3
ONORBIT: /	AOA: 3/3
DEÒRBIT: 3/3	ATO: /
LANDING/SAFING: 3/3	
REDUNDANCY SCREENS: A []	B. [] C []
LOCATION: FORWARD AVIONICS BAYS PART NUMBER: ADS.HCA.270.RPC	
CAUSES: PIECE-PART STRUCTURAL FAIL	URE
EFFECTS/RATIONALE: NO EFFECT.	

DATE: 7/31/87 HIGHEST CRITICALITY HDW/FUNC SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: 3/1R MDAC ID: 1597 ABORT: 3/1R

ITEM: REMOTE POWER CONTROLLER

FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) HEATER CONTROL ASSEMBLY
- 5) 270W HEATER
- 6)
- 7}
- 8) 9)

CRITICALITIES

HDW/FUNC	ABORT	HDW/FUNC
,	RTLS:	3/1R
,	TAL:	3/1R
,	AOA:	3/1R
3/1R	ATO:	/
3/3		•
	/ / 3/1R	/ RTLS: / TAL: / AOA: 3/1R ATO:

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: FORWARD AVIONICS BAYS

PART NUMBER: ADS.HCA.270.RPC

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT HEATER OPERATION. THIS COULD RESULT IN ERRONOUES OR NO AIR DATA REACHING THE ADTAS.

DATE: 7/31/87 SUBSYSTEM: MECH/ADP/EPD&C MDAC ID: 1598	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: 3/3
ITEM: REMOTE POWER CONTROL FAILURE MODE: FAILS SHORTED	LER
LEAD ANALYST: A.D. MONTGOMERY	SUBSYS LEAD: H.J. LOWERY
BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) AIR DATA SUBSYSTEM 3) ELECTRICAL 4) HEATER CONTROL ASSEMBLY 5) 330W HEATER 6) 7) 8) 9)	
CRITICAL	TTTES
FLIGHT PHASE HDW/FUNC	ABORT HDW/FUNC
PRELAUNCH: /	RTLS: 3/3
LIFTOFF: / ONORBIT: /	TAL: 3/3 AOA: 3/3
ONORBIT: / DEORBIT: 3/3	ATO: /
LANDING/SAFING: 3/3	,
REDUNDANCY SCREENS: A []	в[] с[]
LOCATION: FORWARD AVIONICS BAYS PART NUMBER: ADS.HCA.330.RPC	
CAUSES: PIECE-PART STRUCTURAL FAIL	URE
EFFECTS/RATIONALE: NO EFFECT.	
	•

HIGHEST CRITICALITY HDW/FUNC 7/31/87 DATE: 3/1R SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: 3/1R ABORT: MDAC ID: 1599 REMOTE POWER CONTROLLER ITEM: FAILURE MODE: FAILS OPEN LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) AIR DATA SUBSYSTEM ELECTRICAL 3) 4) HEATER CONTROL ASSEMBLY 5) 330W HEATER 6) 7) 8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	,	RTLS:	3/1R
LIFTOFF:	,	TAL:	3/1R
ONORBIT:	,	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING	: 3/1R		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: FORWARD AVIONICS BAYS

PART NUMBER: ADS.HCA.330.RPC

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT HEATER OPERATION. THIS COULD RESULT IN ERRONEOUS OR NO AIR DATA REACHING THE ADTAS.

DATE: 7/31/87 SUBSYSTEM: MECH/ADP/EPD&C MDAC ID: 1600	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: 3/3
ITEM: SWITCH RELAY FAILURE MODE: FAILS SHORTED	
LEAD ANALYST: A.D. MONTGOMERY	SUBSYS LEAD: H.J. LOWERY
BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) AIR DATA SUBSYSTEM 3) ELECTRICAL 4) HEATER CONTROL ASSEMBLY 5) 6) 7) 8)	
CRITICAL	
PRELAUNCH: /	ABORT HDW/FUNC RTLS: 3/3
LIFTOFF: / ONORBIT: /	TAL: 3/3 AOA: 3/3
DEORBIT: 3/3 LANDING/SAFING: 3/3	ATO: / M
REDUNDANCY SCREENS: A []	в[] с[]
LOCATION: FORWARD AVIONICS BAYS PART NUMBER: ADS.HCA.SRL	
CAUSES: PIECE-PART STRUCTURAL FAIL	URE
EFFECTS/RATIONALE: NO EFFECT.	

DATE: 7/31/87 HIGHEST CRITICALITY HDW/FUNC SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: 3/1R MDAC ID: 1601 ABORT: 3/1R

ITEM: SWITCH RELAY FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) HEATER CONTROL ASSEMBLY
- 5)
- 6)
- 7)
- 8) 9)

CRITICALITIES

HDW/FUNC	ABORT	HDW/FUNC		
/	RTLS:	3/1R		
/	TAL:	3/1R		
	AOA:	3/1R		
3/1R	ATO:	/		
3/1R				
	/ / / 3/1R	/ RTLS: / TAL: / AOA: 3/1R ATO:		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: FORWARD AVIONICS BAYS

PART NUMBER: ADS.HCA.SRL

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT HEATER OPERATION. THIS COULD RESULT IN ERRONEOUS OR NO AIR DATA REACHING THE ADTAS.

DATE: 7/31/87 SUBSYSTEM: MECH/ADP/ MDAC ID: 1602			TICALITY HDW/FUNG CLIGHT: 3/3 BORT: 3/3
ITEM: LATCH FAILURE MODE: FAILS			
LEAD ANALYST: A.D. MO	NTGOMERY	SUBSYS LEAD	: H.J. LOWERY
BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUA 2) AIR DATA SUBSYST 3) ELECTRICAL 4) HEATER CONTROL A 5) 6) 7) 8)	EM	·	
	CRITICALI	TIES	
FLIGHT PHASE PRELAUNCH: LIFTOFF: ONORBIT: DEORBIT: LANDING/SAFING	HDW/FUNC / / 3/3	ABORT RTLS: TAL: AOA: ATO:	HDW/FUNC 3/3 3/3 3/3 /
REDUNDANCY SCREENS:	A [] E	3 []	c []
LOCATION: FORWARD PART NUMBER: ADS.HCA	AVIONICS BAYS		
CAUSES: PIECE-PART S	TRUCTURAL FAILU	TRE	
EFFECTS/RATIONALE:			

DATE: 7/31/87 HIGHEST CRITICALITY HDW/FUNC SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: 3/1R MDAC ID: 1603 ABORT: 3/1R

ITEM: LATCH RELAY FAILURE MODE: FAILS OPEN

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

1) MECHANICAL ACTUATION SYSTEM

LEAD ANALYST: A.D. MONTGOMERY

- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) HEATER CONTROL ASSEMBLY

5)

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	,	TAL:	3/1R
ONORBIT:	,	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/1R		•

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: FORWARD AVIONICS BAYS

PART NUMBER: ADS.HCA.LRL

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECTS. SUBSEQUENT FAILURES COULD PREVENT HEATER OPERATION. THIS COULD RESULT IN ERRONEOUS OR NO AIR DATA REACHING THE ADTAS.

DATE: 7/31/87 SUBSYSTEM: MECH/ADP/EPD&C MDAC ID: 1604	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: 3/3
ITEM: EMI FILTER FAILURE MODE: FAILS SHORTED	
LEAD ANALYST: A.D. MONTGOMERY	SUBSYS LEAD: H.J. LOWERY
BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) AIR DATA SUBSYSTEM 3) ELECTRICAL 4) AIR DATA TRANSDUCER ASSEMBLY 5) POWER SUPPLY 6) 7) 8) 9)	
CRITICAL	ITIES
FLIGHT PHASE HDW/FUNC PRELAUNCH: / LIFTOFF: / ONORBIT: / DEORBIT: 3/3 LANDING/SAFING: 3/3	ABORT HDW/FUNC RTLS: 3/3 TAL: 3/3 AOA: 3/3 ATO: /
REDUNDANCY SCREENS: A []	в[] с[]
LOCATION: FORWARD AVIONICS BAYS PART NUMBER: ADS.ADT.PS.FIL	
CAUSES: PIECE-PART STRUCTURAL FAIL	URE
EFFECTS/RATIONALE: NO EFFECT.	
REFERENCES:	

HIGHEST CRITICALITY HDW/FUNC DATE: 7/31/87 FLIGHT: SUBSYSTEM: MECH/ADP/EPD&C 3/1R ABORT: 3/1R MDAC ID: 1605 EMI FILTER ITEM: FAILURE MODE: FAILS OPEN SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: A.D. MONTGOMERY BREAKDOWN HIERARCHY: MECHANICAL ACTUATION SYSTEM 1) AIR DATA SUBSYSTEM 2) ELECTRICAL 3) AIR DATA TRANSDUCER ASSEMBLY 4) 5) POWER SUPPLY 6) 7) 8) 9) CRITICALITIES ABORT HDW/FUNC HDW/FUNC FLIGHT PHASE 3/1R PRELAUNCH: RTLS: LIFTOFF: TAL: 3/1R ONORBIT: AOA: 3/1R 3/1R ATO: DEORBIT: LANDING/SAFING: 3/3 REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: FORWARD AVIONICS BAYS

PART NUMBER: ADS.ADT.PS.FIL

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE: LOSS OF ONE ADTA.

ITEM: OP AMP FAILURE MODE: FAILS SHORTED LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) AIR DATA SUBSYSTEM 3) ELECTRICAL 4) AIR DATA TRANSDUCER ASSEMBLY 5) POWER SUPPLY 6) 7) 8) 9) CRITICALITIES FLIGHT PHASE HDW/FUNC ABORT HDW/FUNC PRELAUNCH: / RTLS: 3/3 LIFTOFF: / TAL: 3/3 ONORBIT: / AOA: 3/3 DEORBIT: 3/3 ATO: / LANDING/SAFING: 3/3 REDUNDANCY SCREENS: A [] B [] C [] LOCATION: FORWARD AVIONICS BAYS PART NUMBER: ADS.ADT.PS.OA CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO EFFECT.			7/31/87 MECH/ADP/1 1606			HIG	HEST (CRITICALI FLIGHT: ABORT:	:	W/FUNC 3/3 3/3
BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) AIR DATA SUBSYSTEM 3) ELECTRICAL 4) AIR DATA TRANSDUCER ASSEMBLY 5) POWER SUPPLY 6) 7) 8) 9) CRITICALITIES FLIGHT PHASE HDW/FUNC ABORT HDW/FUNC PRELAUNCH: / RTLS: 3/3 LIFTOFF: / TAL: 3/3 ONORBIT: / AOA: 3/3 DEORBIT: 3/3 ATO: / LANDING/SAFING: 3/3 REDUNDANCY SCREENS: A [] B [] C [] LOCATION: FORWARD AVIONICS BAYS PART NUMBER: ADS.ADT.PS.OA CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE:					D	, 4,44			er egye	
1) MECHANICAL ACTUATION SYSTEM 2) AIR DATA SUBSYSTEM 3) ELECTRICAL 4) AIR DATA TRANSDUCER ASSEMBLY 5) POWER SUPPLY 6) 7) 8) 9) CRITICALITIES FLIGHT PHASE HDW/FUNC ABORT HDW/FUNC PRELAUNCH: / RTLS: 3/3 LIFTOFF: / TAL: 3/3 ONORBIT: / AOA: 3/3 DEORBIT: 3/3 ATO: / LANDING/SAFING: 3/3 REDUNDANCY SCREENS: A [] B [] C [] LOCATION: FORWARD AVIONICS BAYS PART NUMBER: ADS.ADT.PS.OA CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE:	LEAD	ANALYST	r: A.D. MO	NTGOME	RY	SUBS	SYS LI	EAD: H.J.	. LOWER	Y
FLIGHT PHASE HDW/FUNC PRELAUNCH: / RTLS: 3/3 LIFTOFF: / TAL: 3/3 ONORBIT: / AOA: 3/3 DEORBIT: 3/3 LANDING/SAFING: 3/3 REDUNDANCY SCREENS: A [] B [] C [] LOCATION: FORWARD AVIONICS BAYS PART NUMBER: ADS.ADT.PS.OA CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE:	1) 2) 3) 4) 5) 6) 7)	MECHANI AIR DAT ELECTRI AIR DAT	CAL ACTUA' TA SUBSYST: CAL TA TRANSDU	EM				_		
PRELAUNCH: / RTLS: 3/3 LIFTOFF: / TAL: 3/3 ONORBIT: / AOA: 3/3 DEORBIT: 3/3 ATO: / LANDING/SAFING: 3/3 REDUNDANCY SCREENS: A [] B [] C [] LOCATION: FORWARD AVIONICS BAYS PART NUMBER: ADS.ADT.PS.OA CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE:					CRITICA	LITIES	3			
LOCATION: FORWARD AVIONICS BAYS PART NUMBER: ADS.ADT.PS.OA CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE:		PRELA LIFTO ONORI DEORI	AUNCH: DFF: BIT: BIT:	/ / 3/3		Al	RTL: TAL: AOA:	5: 3/ : 3/ : 3/	/3 /3	
PART NUMBER: ADS.ADT.PS.OA CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE:	REDU	NDANCY S	SCREENS:	A []	B []	c []	
EFFECTS/RATIONALE:						S				
	CAUS	ES: PII	ECE-PART S'	ructu	RAL FAI	LURE	=			
			ONALE:							

HIGHEST CRITICALITY HDW/FUNC 7/31/87 DATE: FLIGHT: 3/1R SUBSYSTEM: MECH/ADP/EPD&C 3/1R ABORT:

MDAC ID: 1607

OP AMP ITEM: FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) AIR DATA TRANSDUCER ASSEMBLY
- POWER SUPPLY 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/1R		•

LANDING/SAFING: 3/1R

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: FORWARD AVIONICS BAYS

PART NUMBER: ADS.ADT.PS.OA

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE: LOSS OF ONE ADTA.

DATE: 7/31/87 SUBSYSTEM: MECH/ADP/EPD&C MDAC ID: 1608 ITEM: REGULATOR FAILURE MODE: FAILS SHORTED	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: 3/3			
LEAD ANALYST: A.D. MONTGOMERY	SUBSYS LEAD: H.J. LOWERY			
BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) AIR DATA SUBSYSTEM 3) ELECTRICAL 4) AIR DATA TRANSDUCER ASSEMBLY 5) POWER SUPPLY 6) 7) 8)				
OD THE CO	ALITIES			
FLIGHT PHASE HDW/FUNC	ABORT HDW/FUNC			
PRELAUNCH: /	RTLS: 3/3 ····			
LIFTOFF: /	TAL: 3/3			
ONORBIT: /	AOA: 3/3			
DEORBIT: 3/3	ATO: /			
LANDING/SAFING: 3/3				
REDUNDANCY SCREENS: A []	B [] C []			
LOCATION: FORWARD AVIONICS BAYS PART NUMBER: ADS.ADT.PS.REG				
CAUSES: PIECE-PART STRUCTURAL FAILURE				
EFFECTS/RATIONALE: NO EFFECT.				

DATE: 7/31/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: 3/1R MDAC ID: 1609 ABORT: 3/1R

ITEM: REGULATOR FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) AIR DATA TRANSDUCER ASSEMBLY
- 5) POWER SUPPLY
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	,	RTLS:	3/1R
LIFTOFF:	,	TAL:	3/1R
ONORBIT:	,	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
TANDING / SARING .	3/10		·

LANDING/SAFING: 3/1R

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: FORWARD AVIONICS BAYS

PART NUMBER: ADS.ADT.PS.REG

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE: LOSS OF ONE ADTA.

HIGHEST CRITICALITY HDW/FUNC 7/31/87 DATE: FLIGHT: 3/1R SUBSYSTEM: MECH/ADP/EPD&C ABORT: 3/1R 1610 MDAC ID: ITEM: GENERATOR FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- AIR DATA SUBSYSTEM 2)
- ELECTRICAL
- 4) AIR DATA TRANSDUCER ASSEMBLY
- POWER SUPPLY
- 6)
- 7)
- 8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	7	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: FORWARD AVIONICS BAYS

PART NUMBER: ADS.ADT.PS.GEN

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE: LOSS OF ONE ADTA.

HDW/FUNC DATE: 7/31/87 HIGHEST CRITICALITY FLIGHT: SUBSYSTEM: MECH/ADP/EPD&C 3/1R ABORT: 3/1R MDAC ID: 1611 **GENERATOR** ITEM: FAILURE MODE: FAILS OPEN LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) AIR DATA SUBSYSTEM ELECTRICAL 3) AIR DATA TRANSDUCER ASSEMBLY 4) POWER SUPPLY 5) 6) 7) 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE PRELAUNCH: RTLS: 3/1R 3/1R LIFTOFF: TAL: AOA: 3/1R ONORBIT: 3/1R ATO: DEORBIT: LANDING/SAFING: 3/3

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: FORWARD AVIONICS BAYS

PART NUMBER: ADS.ADT.PS.GEN

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE: LOSS OF ONE ADTA.

HIGHEST CRITICALITY HDW/FUNC 7/31/87 DATE: SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: 3/1R 3/1R 1612 ABORT: MDAC ID: CLOCK ITEM: FAILURE MODE: FAILS SHORTED LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) AIR DATA SUBSYSTEM 3) ELECTRICAL 4) AIR DATA TRANSDUCER ASSEMBLY POWER SUPPLY 6) 7) 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE RTLS: 3/1R PRELAUNCH: / TAL: 3/1R LIFTOFF: AOA: 3/1R ONORBIT: 3/1R DEORBIT: ATO: LANDING/SAFING: 3/1R REDUNDANCY SCREENS: A [2] B [F] C [P] FORWARD AVIONICS BAYS LOCATION: PART NUMBER: ADS.ADT.PS.CLK CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE:

REFERENCES:

LOSS OF ONE ADTA.

HIGHEST CRITICALITY HDW/FUNC 7/31/87 DATE: FLIGHT: 3/1R SUBSYSTEM: MECH/ADP/EPD&C 3/1R ABORT: MDAC ID: 1613

CLOCK ITEM:

FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- AIR DATA TRANSDUCER ASSEMBLY 4)
- 5) POWER SUPPLY
- 6) 7)
- 8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	7	RTLS:	3/1R
LIFTOFF:	1	TAL:	3/1R
ONORBIT:	7	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

FORWARD AVIONICS BAYS LOCATION:

PART NUMBER: ADS.ADT.PS.CLK

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE: LOSS OF ONE ADTA.

DATE: 7/31/87 SUBSYSTEM: MECH/ADP/EPD&C MDAC ID: 1614	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: 3/3
ITEM: +Q TRANSISTOR FAILURE MODE: FAILS SHORTED	
LEAD ANALYST: A.D. MONTGOMERY	SUBSYS LEAD: H.J. LOWERY
BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) AIR DATA SUBSYSTEM 3) ELECTRICAL 4) AIR DATA TRANSDUCER ASSEMBLY 5) POWER SUPPLY 6) 7) 8) 9)	
CRITICALI'	TTFS
FLIGHT PHASE HDW/FUNC PRELAUNCH: / LIFTOFF: / ONORBIT: / DEORBIT: 3/3 LANDING/SAFING: 3/3	ABORT HDW/FUNC RTLS: 3/3 TAL: 3/3 AOA: 3/3 ATO: /
REDUNDANCY SCREENS: A [] B	c []
LOCATION: FORWARD AVIONICS BAYS PART NUMBER: ADS.ADT.PS.+QT	
CAUSES: PIECE-PART STRUCTURAL FAILUREFFECTS/RATIONALE: NO EFFECT.	RE

HIGHEST CRITICALITY HDW/FUNC DATE: 7/31/87 3/1R SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: ABORT: 3/1R MDAC ID: 1615 ITEM: +Q TRANSISTOR FAILURE MODE: FAILS OPEN SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: A.D. MONTGOMERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) AIR DATA SUBSYSTEM 3) ELECTRICAL AIR DATA TRANSDUCER ASSEMBLY 4) POWER SUPPLY 5) 6) 7) 8) 9) CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	7	RTLS:	3/1R
LIFTOFF:	7	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	1. 1
LANDING/SAFING	: 3/3		-

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: FORWARD AVIONICS BAYS

PART NUMBER: ADS.ADT.PS.+QT

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE: LOSS OF ONE ADTA.

DATE: 7/31/87 SUBSYSTEM: MECH/ADP/EPD&C MDAC ID: 1616	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: 3/3
ITEM: -Q TRANSISTOR FAILURE MODE: FAILS SHORTED	
LEAD ANALYST: A.D. MONTGOMERY	SUBSYS LEAD: H.J. LOWERY
BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) AIR DATA SUBSYSTEM 3) ELECTRICAL 4) AIR DATA TRANSDUCER ASSEMBLY 5) POWER SUPPLY 6) 7) 8) 9)	
CRITICAL	TTTES
FLIGHT PHASE HDW/FUNC PRELAUNCH: / LIFTOFF: / ONORBIT: / DEORBIT: 3/3 LANDING/SAFING: 3/3	ABORT HDW/FUNC RTLS: 3/3 TAL: 3/3 AOA: 3/3 ATO: /
REDUNDANCY SCREENS: A []	в[] с[]
LOCATION: FORWARD AVIONICS BAYS PART NUMBER: ADS.ADT.PSQT	
CAUSES: PIECE-PART STRUCTURAL FAIL	URE
EFFECTS/RATIONALE: NO EFFECT.	

HIGHEST CRITICALITY HDW/FUNC DATE: 7/31/87 SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: 3/1R 3/1R MDAC ID: 1617 ABORT: ITEM: -Q TRANSISTOR FAILURE MODE: FAILS OPEN SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: A.D. MONTGOMERY BREAKDOWN HIERARCHY: MECHANICAL ACTUATION SYSTEM AIR DATA SUBSYSTEM 2) ELECTRICAL 3) AIR DATA TRANSDUCER ASSEMBLY 4) POWER SUPPLY

7) 8) 9)

CRITICALITIES

FLIGHT PHASE HDW/FUNC HDW/FUNC ABORT RTLS: 3/1R PRELAUNCH: LIFTOFF: TAL: 3/1R ONORBIT: AOA: 3/1R DEORBIT: 3/1R ATO: LANDING/SAFING: 3/3

B [F] C [P] REDUNDANCY SCREENS: A [2]

LOCATION: FORWARD AVIONICS BAYS

PART NUMBER: ADS.ADT.PS.-QT

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE: LOSS OF ONE ADTA.

REFERENCES:

5)

6)

DATE: 7/3 SUBSYSTEM: MECH/ MDAC ID: 1618			CICALITY LIGHT: BORT:	HDW/FUNC 3/3 3/3
ITEM: THE FAILURE MODE: FA				
LEAD ANALYST: A.I	. MONTGOMERY	SUBSYS LEAD:	H.J. LO	WERY
2) AIR DATA SUB 3) ELECTRICAL 4) AIR DATA TRA	ACTUATION SYSTEM BSYSTEM ANSDUCER ASSEMBLY			į.
5) POWER SUPPLY 6) 7) 8) 9)	!	·		
	CRITICAI	LITIES		
FLIGHT PHASE	*	ABORT	HDW/FUN	C
PRELAUNCH:	· /	RTLS:	3/3	
LIFTOFF: ONORBIT:	/	TAL: AOA:	3/3 3/3	
DEORBIT: LANDING/SA	3/3	ATO:	/	-
REDUNDANCY SCREEN		B	c []	
LOCATION: FOR PART NUMBER: ADS	RWARD AVIONICS BAYS S.ADT.PS.TMR	5		
CAUSES: PIECE-PA	ART STRUCTURAL FAII	LURE	.*	- 11
EFFECTS/RATIONALE NO EFFECT.	E:			

HIGHEST CRITICALITY HDW/FUNC 7/31/87 DATE: 3/1R SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: 3/1R MDAC ID: 1619 ABORT: ITEM: TRANSFORMER FAILURE MODE: FAILS SHORTED LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) AIR DATA SUBSYSTEM 3) ELECTRICAL 4) AIR DATA TRANSDUCER ASSEMBLY POWER SUPPLY 5) 6) 7) 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE RTLS: 3/1R PRELAUNCH: TAL: 3/1R LIFTOFF: AOA: 3/1R ONORBIT: 3/1R ATO: DEORBIT: LANDING/SAFING: 3/3

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: FORWARD AVIONICS BAYS

PART NUMBER: ADS.ADT.PS.TMR

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE: LOSS OF ONE ADTA.

DATE: 7/31/87 SUBSYSTEM: MECH/ADP/EPD&C MDAC ID: 1620	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: 3/3
ITEM: +10V AMP FAILURE MODE: FAILS SHORTED	
LEAD ANALYST: A.D. MONTGOMERY	SUBSYS LEAD: H.J. LOWERY
BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) AIR DATA SUBSYSTEM 3) ELECTRICAL 4) AIR DATA TRANSDUCER ASSEMBLY 5) POWER SUPPLY 6) 7) 8) 9)	
CRITICAL	ITIES
FLIGHT PHASE HDW/FUNC PRELAUNCH: / LIFTOFF: / ONORBIT: / DEORBIT: 3/3 LANDING/SAFING: 3/3	ABORT HDW/FUNC RTLS: 3/3 TAL: 3/3 AOA: 3/3 ATO: /
REDUNDANCY SCREENS: A []	в [] с []
LOCATION: FORWARD AVIONICS BAYS PART NUMBER: ADS.ADT.PS.+AM	
CAUSES: PIECE-PART STRUCTURAL FAIL	JRE 1 191
EFFECTS/RATIONALE: NO EFFECT.	

REFERENCES:

REPORT DATE 11/25/87 C-140

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HIGHEST CRITICALITY HDW/FUNC 7/31/87 DATE: 3/1R FLIGHT: SUBSYSTEM: MECH/ADP/EPD&C 3/1R ABORT: 1621 MDAC ID: +10V AMP ITEM: FAILURE MODE: FAILS OPEN SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: A.D. MONTGOMERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM AIR DATA SUBSYSTEM 2) ELECTRICAL 3) AIR DATA TRANSDUCER ASSEMBLY 4) POWER SUPPLY 5) 6) 7) 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE RTLS: 3/1R PRELAUNCH: 3/1R TAL: LIFTOFF: 3/1R AOA: ONORBIT: 3/1R ATO: DEORBIT: LANDING/SAFING: 3/3

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: FORWARD AVIONICS BAYS

PART NUMBER: ADS.ADT.PS.+AM

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE: LOSS OF ONE ADTA.

DATE: 7/31/87 SUBSYSTEM: MECH/ADP/EPD&C MDAC ID: 1622	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: 3/3			
ITEM: -10V AMP FAILURE MODE: FAILS SHORTED				
LEAD ANALYST: A.D. MONTGOMERY	SUBSYS LEAD: H.J. LOWERY			
BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) AIR DATA SUBSYSTEM 3) ELECTRICAL 4) AIR DATA TRANSDUCER ASSEMBLY 5) POWER SUPPLY 6) 7) 8) 9)				
CRITICAL				
	ABORT HDW/FUNC RTLS: 3/3 TAL: 3/3 AOA: 3/3 ATO: /			
REDUNDANCY SCREENS: A []	s [] c []			
LOCATION: FORWARD AVIONICS BAYS PART NUMBER: ADS.ADT.PSAM				
CAUSES: PIECE-PART STRUCTURAL FAILU	JRE			
EFFECTS/RATIONALE: NO EFFECT.				

DATE: 7/31/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: 3/1R MDAC ID: 1623 ABORT: 3/1R

ITEM: -10V AMP FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) AIR DATA TRANSDUCER ASSEMBLY
- 5) POWER SUPPLY
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	,	RTLS:	3/1R
LIFTOFF:	,	TAL:	3/1R
ONORBIT:	,	AOA:	3/1R
DEORBIT:	3/1R	ATO:	. /
LANDING/SAFING	: 3/3		•

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: FORWARD AVIONICS BAYS

PART NUMBER: ADS.ADT.PS.-AM

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE: LOSS OF ONE ADTA.

HIGHEST CRITICALITY HDW/FUNC 7/31/87 DATE: FLIGHT: 3/3 SUBSYSTEM: MECH/ADP/EPD&C ABORT: 3/3-MDAC ID: 1624 +10V TRANSISTOR ITEM: FAILURE MODE: FAILS SHORTED LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM AIR DATA SUBSYSTEM 2) ELECTRICAL 3) AIR DATA TRANSDUCER ASSEMBLY 4) POWER SUPPLY 6) 7) 8) 9) CRITICALITIES HDW/FUNC HDW/FUNC ABORT FLIGHT PHASE RTLS: PRELAUNCH: 3/3 / 3/3 TAL: LIFTOFF: 3/3 AOA: ONORBIT: 3/3 ATO: DEORBIT: LANDING/SAFING: 3/3 REDUNDANCY SCREENS: A [] B [] C [] LOCATION: FORWARD AVIONICS BAYS PART NUMBER: ADS.ADT.PS.+TR CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO EFFECT.

HIGHEST CRITICALITY HDW/FUNC DATE: 7/31/87 SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: 3/1R MDAC ID: ABORT: 3/1R 1625 +10V TRANSISTOR ITEM: FAILURE MODE: FAILS OPEN LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) AIR DATA SUBSYSTEM ELECTRICAL 3) AIR DATA TRANSDUCER ASSEMBLY 4) POWER SUPPLY 5) 6) 7) 8) 9) CRITICALITIES HDW/FUNC HDW/FUNC FLIGHT PHASE ABORT RTLS: 3/1R PRELAUNCH: TAL: LIFTOFF: 3/1R ONORBIT: AOA: 3/1R ATO: DEORBIT: 3/1R LANDING/SAFING: 3/3 REDUNDANCY SCREENS: A [2] B[F] C[P] FORWARD AVIONICS BAYS LOCATION: PART NUMBER: ADS.ADT.PS.+TR

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE: LOSS OF ONE ADTA.

DATE: 7/31/87 SUBSYSTEM: MECH/ADP/EPD&C MDAC ID: 1626	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: 3/3
ITEM: -10V TRANSISTOR FAILURE MODE: FAILS SHORTED	
LEAD ANALYST: A.D. MONTGOMERY	SUBSYS LEAD: H.J. LOWERY
BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) AIR DATA SUBSYSTEM 3) ELECTRICAL 4) AIR DATA TRANSDUCER ASSEMBLY 5) POWER SUPPLY 6)	
7) 8) 9)	
CRITICAL	TTT FS
FLIGHT PHASE HDW/FUNC	ABORT HDW/FUNC
PRELAUNCH: /	RTLS: 3/3
· · · · · · · · · · · · · · · · · · ·	TAL: 3/3
	AOA: 3/3
ONORBIT: /	· · · · · · · · · · · · · · · · · · ·
DEORBIT: 3/3 LANDING/SAFING: 3/3	ATO: /
REDUNDANCY SCREENS: A []	3 [] C []
LOCATION: FORWARD AVIONICS BAYS PART NUMBER: ADS.ADT.PSTR	
CAUSES: PIECE-PART STRUCTURAL FAIL	JRE
EFFECTS/RATIONALE: NO EFFECT.	

DATE: 7/31/87 HIGHEST CRITICALITY HDW/FUNC MECH/ADP/EPD&C FLIGHT: 3/1R SUBSYSTEM: ABORT: 3/1R MDAC ID: 1627 -10V TRANSISTOR ITEM: FAILURE MODE: FAILS OPEN LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: MECHANICAL ACTUATION SYSTEM 1) 2) AIR DATA SUBSYSTEM 3) ELECTRICAL 4) AIR DATA TRANSDUCER ASSEMBLY 5) POWER SUPPLY 6) 7) 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE 3/1R PRELAUNCH: RTLS:

LIFTOFF: TAL: 3/1R AOA: 3/1R ONORBIT: 3/1R ATO: DEORBIT:

LANDING/SAFING: 3/3

A [2] B[F] C[P] REDUNDANCY SCREENS:

LOCATION: FORWARD AVIONICS BAYS

PART NUMBER: ADS.ADT.PS.-TR

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE: LOSS OF ONE ADTA.

HIGHEST CRITICALITY HDW/FUNC 7/31/87 DATE: SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: 3/3 ABORT: 3/3 MDAC ID: 1628 POWER SUPPLY TEST AMP ITEM: FAILURE MODE: FAILS SHORTED LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) AIR DATA SUBSYSTEM 3) ELECTRICAL 4) AIR DATA TRANSDUCER ASSEMBLY 5) 6) 7) 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE RTLS: TAL: AOA: ATO: , , , 3/3 PRELAUNCH: 3/3 LIFTOFF: ONORBIT: 3/3 DEORBIT: 3/3 / LANDING/SAFING: 3/3 REDUNDANCY SCREENS: A [] B [] C [] FORWARD AVIONICS BAYS LOCATION: PART NUMBER: ADS.ADT.TA CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO EFFECT.

HIGHEST CRITICALITY HDW/FUNC DATE: 7/31/87 SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: 3/1R MDAC ID: ABORT: 3/1R 1629 POWER SUPPLY TEST AMP ITEM: FAILURE MODE: FAILS OPEN LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) AIR DATA SUBSYSTEM 3) ELECTRICAL 4) AIR DATA TRANSDUCER ASSEMBLY 5) 6) 7) 8) 9) CRITICALITIES ABORT HDW/FUNC HDW/FUNC FLIGHT PHASE PRELAUNCH: RTLS: 3/1R

LIFTOFF: TAL: 3/1R ONORBIT: AOA: 3/1R 3/1R ATO: DEORBIT:

LANDING/SAFING: 3/3

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: FORWARD AVIONICS BAYS

PART NUMBER: ADS.ADT.TA

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE: LOSS OF ONE ADTA.

HIGHEST CRITICALITY HDW/FUNC 7/31/87 DATE: FLIGHT: MECH/ADP/EPD&C 3/3 SUBSYSTEM: ABORT: 3/3 MDAC ID: 1630 ITEM: AMP FAILURE MODE: FAILS SHORTED SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: A.D. MONTGOMERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) AIR DATA SUBSYSTEM 3) ELECTRICAL AIR DATA TRANSDUCER ASSEMBLY 4) TEMP BRIDGE HIGH INPUT 7) 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE RTLS: 3/3 PRELAUNCH: / TAL: 3/3 LIFTOFF: AOA: ONORBIT: 3/3 ATO: 3/3 DEORBIT: LANDING/SAFING: 3/3 REDUNDANCY SCREENS: A[] B[] C[FORWARD AVIONICS BAYS LOCATION: PART NUMBER: ADS.ADT.TB.HA CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO EFFECT.

7/31/87 HIGHEST CRITICALITY HDW/FUNC DATE: SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: 3/3 3/3 ABORT: MDAC ID: 1631 ITEM: AMP FAILURE MODE: FAILS OPEN LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) AIR DATA SUBSYSTEM 3) ELECTRICAL 4) AIR DATA TRANSDUCER ASSEMBLY 5) TEMP BRIDGE HIGH INPUT 6) 7) 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE / PRELAUNCH: RTLS: 3/3 3/3 LIFTOFF: TAL: / AOA: 3/3 ONORBIT: ATO: 3/3 DEORBIT: LANDING/SAFING: 3/3 REDUNDANCY SCREENS: A [] B [] C [] LOCATION: FORWARD AVIONICS BAYS PART NUMBER: ADS.ADT.TB.HA CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: LOSS OF TEMPERATURE DATA.

HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: 3/3						
SUBSYS LEAD: H.J. LOWERY						
BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) AIR DATA SUBSYSTEM 3) ELECTRICAL 4) AIR DATA TRANSDUCER ASSEMBLY 5) TEMP BRIDGE 6) LOW INPUT 7) 8)						
ITIES						
ABORT HDW/FUNC RTLS: 3/3						
TAL: 3/3						
AOA: 3/3						
ATO: /						
в[] с[]						
URE						

DATE: 7/31/87 HIGHEST CRITICALITY HDW/FUNC 3/3 SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: 3/3 MDAC ID: 1633 ABORT: ITEM: AMP FAILURE MODE: FAILS OPEN LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM AIR DATA SUBSYSTEM 2) ELECTRICAL 3) 4) AIR DATA TRANSDUCER ASSEMBLY 5) TEMP BRIDGE LOW INPUT 6) 7) 8) 9) CRITICALITIES HDW/FUNC FLIGHT PHASE HDW/FUNC ABORT / PRELAUNCH: RTLS: 3/3 LIFTOFF: TAL: 3/3 AOA: 3/3 ONORBIT: DEORBIT: 3/3 ATO: LANDING/SAFING: 3/3 REDUNDANCY SCREENS: A [] B [] C [] LOCATION: FORWARD AVIONICS BAYS PART NUMBER: ADS.ADT.TB.LA CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: LOSS OF TEMPERATURE DATA.

HIGHEST CRITICALITY HDW/FUNC 7/31/87 DATE: FLIGHT: 3/3 SUBSYSTEM: MECH/ADP/EPD&C 3/3 ABORT: MDAC ID: 1634 THERMISTER THERMOMETER ITEM: FAILURE MODE: FAILS SHORTED LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM AIR DATA SUBSYSTEM 2) 3) ELECTRICAL AIR DATA TRANSDUCER ASSEMBLY 4) TRANSDUCER CIRCUIT 5) 6) 7) 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE RTLS: PRELAUNCH: 3/3 TAL: 3/3 LIFTOFF: AOA: 3/3 ONORBIT: 3/3 ATO: DEORBIT: LANDING/SAFING: 3/3 REDUNDANCY SCREENS: A [] B [] C [] LOCATION: FORWARD AVIONICS BAYS PART NUMBER: ADS.ADT.TC.TT CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO EFFECT.

HIGHEST CRITICALITY HDW/FUNC DATE: 7/31/87 3/3 SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: ABORT: 3/3 MDAC ID: 1635 THERMISTER THERMOMETER ITEM: FAILURE MODE: FAILS OPEN SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: A.D. MONTGOMERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) AIR DATA SUBSYSTEM 3) ELECTRICAL AIR DATA TRANSDUCER ASSEMBLY 4) 5) TRANSDUCER CIRCUIT 6) 7) 8) 9) CRITICALITIES HDW/FUNC HDW/FUNC ABORT FLIGHT PHASE 3/3 RTLS: PRELAUNCH: TAL: LIFTOFF: 3/3 ONORBIT: AOA: 3/3 DEORBIT: 3/3 ATO: LANDING/SAFING: 3/3 REDUNDANCY SCREENS: A [B[] C[]] LOCATION: FORWARD AVIONICS BAYS PART NUMBER: ADS.ADT.TC.TT CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: LOSS OF TRANSDUCER TEMPERATURE DATA.

DATE: 7/31/87 SUBSYSTEM: MECH/ADP/EPD&C MDAC ID: 1636	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: 3/3				
ITEM: FIELD EFFECT TRANSISTOR FAILURE MODE: FAILS SHORTED					
LEAD ANALYST: A.D. MONTGOMERY	SUBSYS LEAD: H.J. LOWERY				
BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) AIR DATA SUBSYSTEM 3) ELECTRICAL 4) AIR DATA TRANSDUCER ASSEMBLY 5) TRANSDUCER CIRCUIT 6) 7) 8) 9)					
CRITICAL					
FLIGHT PHASE HDW/FUNC PRELAUNCH: / LIFTOFF: / ONORBIT: / DEORBIT: 3/3 LANDING/SAFING: 3/3	ABORT HDW/FUNC RTLS: 3/3 TAL: 3/3 AOA: 3/3 ATO: /				
REDUNDANCY SCREENS: A []	в[] с[]				
LOCATION: FORWARD AVIONICS BAYS PART NUMBER: ADS.ADT.TC.FET					
CAUSES: PIECE-PART STRUCTURAL FAIL	JRE				
EFFECTS/RATIONALE: NO EFFECT.	ு ு∶் சத்ச ⊶				
REFERENCES:					

HIGHEST CRITICALITY HDW/FUNC DATE: 7/31/87 SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: 3/1R MDAC ID: ABORT: 3/1R 1637 FIELD EFFECT TRANSISTOR ITEM: FAILURE MODE: FAILS OPEN SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: A.D. MONTGOMERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) AIR DATA SUBSYSTEM ELECTRICAL 3) AIR DATA TRANSDUCER ASSEMBLY 4) TRANSDUCER CIRCUIT 6) 7) 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE PRELAUNCH: RTLS: 3/1R

3/1R TAL: LIFTOFF: 3/1R ONORBIT: AOA: 3/1R DEORBIT: ATO: /

LANDING/SAFING: 3/3

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: FORWARD AVIONICS BAYS

PART NUMBER: ADS.ADT.TC.FET

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

LOSS OF TRANSDUCER DATA.

DATE: 7/31/87 SUBSYSTEM: MECH/ADP/EPD&C MDAC ID: 1638	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: 3/3
ITEM: CONTROL CIRCUIT FAILURE MODE: FAILS SHORTED	
LEAD ANALYST: A.D. MONTGOMERY	SUBSYS LEAD: H.J. LOWERY
BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) AIR DATA SUBSYSTEM 3) ELECTRICAL 4) AIR DATA TRANSDUCER ASSEMBLY 5) TRANSDUCER CIRCUIT 6) 7) 8) 9)	
CRITICAL	ITIES
	ABORT HDW/FUNC RTLS: 3/3 TAL: 3/3 AOA: 3/3 ATO: /
REDUNDANCY SCREENS: A []	B[] C[]
LOCATION: FORWARD AVIONICS BAYS PART NUMBER: ADS.ADT.TC.CC	
CAUSES: PIECE-PART STRUCTURAL FAIL	JRE
EFFECTS/RATIONALE: NO EFFECT.	

DATE: 7/31/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: 3/1R MDAC ID: 1639 ABORT: 3/1R

ITEM: CONTROL CIRCUIT

FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) AIR DATA TRANSDUCER ASSEMBLY
- 5) TRANSDUCER CIRCUIT

6)

7)

8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	,	RTLS:	3/1R
LIFTOFF:	./	TAL:	3/1R
ONORBIT:	,	AOA:	3/1R
DEORBIT:	3/1R	ATO:	,
LANDING/SAFING:	3/3		·

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: FORWARD AVIONICS BAYS

PART NUMBER: ADS.ADT.TC.CC

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

LOSS OF TRANSDUCER DATA.

HIGHEST CRITICALITY HDW/FUNC 7/31/87 DATE: FLIGHT: 3/1R SUBSYSTEM: MECH/ADP/EPD&C ABORT: 3/1R MDAC ID: 1640 ITEM: READ ONLY MEMORY FAILURE MODE: FAILS SHORTED LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) AIR DATA SUBSYSTEM ELECTRICAL 3) AIR DATA TRANSDUCER ASSEMBLY 4) TRANSDUCER CIRCUIT 6) 7) 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE RTLS: TAL: AOA: 3/1R PRELAUNCH: / 3/1R LIFTOFF: 3/1R ONORBIT: 3/1R ATO: / DEORBIT: LANDING/SAFING: 3/3 REDUNDANCY SCREENS: A [2] B [F] C [P] FORWARD AVIONICS BAYS LOCATION: PART NUMBER: ADS.ADT.TC.ROM CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE:

REFERENCES:

LOSS OF TRANSDUCER DATA.

HIGHEST CRITICALITY HDW/FUNC DATE: 7/31/87 SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: 3/1R ABORT: 3/1R MDAC ID: 1641 READ ONLY MEMORY ITEM: FAILURE MODE: FAILS OPEN LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) AIR DATA SUBSYSTEM ELECTRICAL 3) AIR DATA TRANSDUCER ASSEMBLY 4) 5) TRANSDUCER CIRCUIT 6) .7) 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE RTLS: 3/1R PRELAUNCH: LIFTOFF: TAL: 3/1R

AOA:

ATO:

3/1R

REDUNDANCY SCREENS: A [2] B [F] C [P]

3/1R

LOCATION: FORWARD AVIONICS BAYS

LANDING/SAFING: 3/3

PART NUMBER: ADS.ADT.TC.ROM

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

LOSS OF TRANSDUCER DATA.

ONORBIT:

DEORBIT:

7/31/87 HIGHEST CRITICALITY HDW/FUNC DATE: SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: 3/3 ABORT: 3/3 1642 MDAC ID: TRANSDUCER TEMP AMP ITEM: FAILURE MODE: FAILS SHORTED ami im taliala al l'armete in interna LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM AIR DATA SUBSYSTEM 2) ELECTRICAL AIR DATA TRANSDUCER ASSEMBLY 4) TRANSDUCER CIRCUIT 7) 8) 9) CRITICALITIES HDW/FUNC HDW/FUNC ABORT FLIGHT PHASE RTLS: 3/3 PRELAUNCH: TAL: 3/3 LIFTOFF: AOA: 3/3 ONORBIT: 3/3 ATO: DEORBIT: LANDING/SAFING: 3/3 B[] C[] REDUNDANCY SCREENS: A [] FORWARD AVIONICS BAYS LOCATION: PART NUMBER: ADS.ADT.TC.TTA CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: LOSS OF TRANSDUCER TEMPERATURE DATA.

HIGHEST CRITICALITY HDW/FUNC 7/31/87 DATE: FLIGHT: 3/3 SUBSYSTEM: MECH/ADP/EPD&C 3/3 ABORT: MDAC ID: 1643 ITEM: TRANSDUCER TEMP AMP FAILURE MODE: FAILS OPEN LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM AIR DATA SUBSYSTEM 2) ELECTRICAL 3) 4) AIR DATA TRANSDUCER ASSEMBLY 5) TRANSDUCER CIRCUIT 6) 7) 8) 9) CRITICALITIES FLIGHT PHASE HDW/FUNC ABORT HDW/FUNC 3/3 RTLS: PRELAUNCH: 3/3 TAL: LIFTOFF: AOA: 3/3 ONORBIT: 3/3 ATO: DEORBIT: LANDING/SAFING: 3/3 REDUNDANCY SCREENS: A [] B [] C [] FORWARD AVIONICS BAYS LOCATION: PART NUMBER: ADS.ADT.TC.TTA CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: LOSS OF TRANSDUCER TEMPERATURE DATA.

DATE: 7/31/87 SUBSYSTEM: MECH/ADP/EPD&C MDAC ID: 1644	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: 3/3
ITEM: AMP FAILURE MODE: FAILS SHORTED	
LEAD ANALYST: A.D. MONTGOMERY	SUBSYS LEAD: H.J. LOWERY
BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTE 2) AIR DATA SUBSYSTEM 3) ELECTRICAL 4) AIR DATA TRANSDUCER ASSEME 5) TRANSDUCER CIRCUIT 6) 7) 8) 9)	
CRIT	CICALITIES
FLIGHT PHASE HDW/FUNC PRELAUNCH: / LIFTOFF: / ONORBIT: / DEORBIT: 3/3 LANDING/SAFING: 3/3	ABORT HDW/FUNC RTLS: 3/3 TAL: 3/3 AOA: 3/3 ATO: /
REDUNDANCY SCREENS: A []	в[] с[]
LOCATION: FORWARD AVIONICS PART NUMBER: ADS.ADT.TC.AMP	BAYS
CAUSES: PIECE-PART STRUCTURAL	FAILURE
EFFECTS/RATIONALE: NO EFFECT.	
REFERENCES:	

HIGHEST CRITICALITY HDW/FUNC 7/31/87 DATE: 3/1R SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: 3/1R ABORT: MDAC ID: ITEM: AMP FAILURE MODE: FAILS OPEN LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) AIR DATA SUBSYSTEM ELECTRICAL 3) AIR DATA TRANSDUCER ASSEMBLY 4) 5) TRANSDUCER CIRCUIT 6) 7) 8) 9) CRITICALITIES FLIGHT PHASE HDW/FUNC ABORT HDW/FUNC RTLS: 3/1R PRELAUNCH:

TAL: 3/1R LIFTOFF: AOA: 3/1R ONORBIT: 3/1R ATO: DEORBIT: --/

LANDING/SAFING: 3/3

REDUNDANCY SCREENS: A [2] B [F] C [P]

FORWARD AVIONICS BAYS LOCATION:

PART NUMBER: ADS.ADT.TC.AMP

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

LOSS OF TRANSDUCER DATA.

DATE: 7/31/87 SUBSYSTEM: MECH/ADP/EPD&C MDAC ID: 1646	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: 3/3
ITEM: TRANSISTOR FAILURE MODE: FAILS SHORTED	
LEAD ANALYST: A.D. MONTGOMERY	SUBSYS LEAD: H.J. LOWERY
BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) AIR DATA SUBSYSTEM 3) ELECTRICAL 4) AIR DATA TRANSDUCER ASSEMBLY 5) TRANSDUCER CIRCUIT 6) 7) 8) 9)	
CRITICAL	
FLIGHT PHASE HDW/FUNC PRELAUNCH: / LIFTOFF: / ONORBIT: / DEORBIT: 3/3 LANDING/SAFING: 3/3	
REDUNDANCY SCREENS: A []	в [] с []
LOCATION: FORWARD AVIONICS BAYS PART NUMBER: ADS.ADT.TC.	
CAUSES: PIECE-PART STRUCTURAL FAIL	JRE
EFFECTS/RATIONALE: NO EFFECT.	

HIGHEST CRITICALITY HDW/FUNC 7/31/87 DATE: FLIGHT: 3/1R SUBSYSTEM: MECH/ADP/EPD&C 3/1R ABORT: MDAC ID: 1647 ITEM: TRANSISTOR FAILURE MODE: FAILS OPEN LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) AIR DATA SUBSYSTEM 3) ELECTRICAL 4) AIR DATA TRANSDUCER ASSEMBLY TRANSDUCER CIRCUIT 6) 7) 8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	. /	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/1R		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: FORWARD AVIONICS BAYS

PART NUMBER: ADS.ADT.TC.

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

LOSS OF TRANSDUCER DATA.

HIGHEST CRITICALITY HDW/FUNC 7/31/87 DATE: SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: 3/1R 3/1R ABORT: MDAC ID: 1648 ITEM: AND GATE FAILURE MODE: FAILS SHORTED i de de la constante de la con SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: A.D. MONTGOMERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) AIR DATA SUBSYSTEM 3) ELECTRICAL AIR DATA TRANSDUCER ASSEMBLY 4) TRANSDUCER CIRCUIT 6) 7) 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE RTLS: TAL: AOA: 3/1R PRELAUNCH: 3/1R LIFTOFF: / 3/1R ONORBIT: 3/1R ATO: DEORBIT: LANDING/SAFING: 3/3 REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: FORWARD AVIONICS BAYS

PART NUMBER: ADS.ADT.TC.AG

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

LOSS OF TRANSDUCER DATA.

HIGHEST CRITICALITY HDW/FUNC 7/31/87 DATE: FLIGHT: 3/1R SUBSYSTEM: MECH/ADP/EPD&C 3/1R ABORT: MDAC ID: 1649

ITEM: AND GATE FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) AIR DATA TRANSDUCER ASSEMBLY
- TRANSDUCER CIRCUIT 5)
- 6) 7)
- 8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	,	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING	: 3/3		•

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: FORWARD AVIONICS BAYS

PART NUMBER: ADS.ADT.TC.AG

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

LOSS OF TRANSDUCER DATA.

INDEPENDENT ORBITER ASSESSMENT

ORBITER SUBSYSTEM ANALYSIS WORKSHEET HIGHEST CRITICALITY HDW/FUNC DATE: 7/31/87 SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: 3/1R ABORT: 3/1R MDAC ID: 1650 SERIAL SHIFT REGISTER ITEM: FAILURE MODE: FAILS SHORTED LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM AIR DATA SUBSYSTEM 2) ELECTRICAL 3) AIR DATA TRANSDUCER ASSEMBLY 4) TRANSDUCER CIRCUIT 6) 7) 8)

CRITICALITIES

HDW/FUNC ABORT FLIGHT PHASE HDW/FUNC RTLS: TAL: 3/1R PRELAUNCH: / 1 3/1R LIFTOFF: AQA: ONORBIT: 3/1R 3/1R ATO: DEORBIT: / LANDING/SAFING: 3/3

REDUNDANCY SCREENS: A [2] B [F] C [P]

FORWARD AVIONICS BAYS LOCATION:

PART NUMBER: ADS.ADT.TC.SSR

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

LOSS OF TRANSDUCER DATA.

REFERENCES:

9)

HIGHEST CRITICALITY HDW/FUNC 7/31/87 DATE: FLIGHT: 3/1R SUBSYSTEM: MECH/ADP/EPD&C

ABORT: 3/1R MDAC ID: 1651

SERIAL SHIFT REGISTER ITEM:

FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- MECHANICAL ACTUATION SYSTEM
- AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- AIR DATA TRANSDUCER ASSEMBLY 4)
- TRANSDUCER CIRCUIT 5)
- 6)
- 7)
- 8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING	: 3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: FORWARD AVIONICS BAYS

PART NUMBER: ADS.ADT.TC.SSR

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

LOSS OF TRANSDUCER DATA.

HIGHEST CRITICALITY HDW/FUNC DATE: 7/31/87 SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: 3/1R ABORT: 3/1R MDAC ID: 1652 ITEM: BINARY COUNTER FAILURE MODE: FAILS SHORTED SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: A.D. MONTGOMERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) AIR DATA SUBSYSTEM 3) ELECTRICAL AIR DATA TRANSDUCER ASSEMBLY 4) TRANSDUCER CIRCUIT 6) 7). 8) 9) CRITICALITIES HDW/FUNC HDW/FUNC ABORT FLIGHT PHASE RTLS: 3/1R ---PRELAUNCH: LIFTOFF: TAL: 3/1R / AOA: 3/1R ONORBIT: 3/1R ATO: DEORBIT: / LANDING/SAFING: 3/3 REDUNDANCY SCREENS: A [2] B [F] C [P] FORWARD AVIONICS BAYS LOCATION: PART NUMBER: ADS.ADT.TC.BC CAUSES: PIECE-PART STRUCTURAL FAILURE

REFERENCES:

EFFECTS/RATIONALE:

LOSS OF TRANSDUCER DATA.

HIGHEST CRITICALITY HDW/FUNC 7/31/87 DATE: FLIGHT: 3/1R SUBSYSTEM: MECH/ADP/EPD&C ABORT: 3/1R MDAC ID: 1653 BINARY COUNTER ITEM: FAILURE MODE: FAILS OPEN SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: A.D. MONTGOMERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) AIR DATA SUBSYSTEM 3) ELECTRICAL 4) AIR DATA TRANSDUCER ASSEMBLY 5) TRANSDUCER CIRCUIT 6) 7)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	: 3/3	-	

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: FORWARD AVIONICS BAYS

PART NUMBER: ADS.ADT.TC.BC

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

LOSS OF TRANSDUCER DATA.

REFERENCES:

8) 9)

HIGHEST CRITICALITY HDW/FUNC 7/31/87 DATE: 3/1R SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: 3/1R 1654 ABORT: MDAC ID: ADDRESSABLE SWITCH ITEM:

FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- AIR DATA SUBSYSTEM
- ELECTRICAL 3)
- AIR DATA TRANSDUCER ASSEMBLY 4)
- A/D CONVERTER

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	,	RTLS:	3/1R
LIFTOFF:	7	TAL:	3/1R
ONORBIT:	,	AOA:	3/1R
DEORBIT:	3/1R	ATO:	,
LANDING/SAFING:	3/3	•	·

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: FORWARD AVIONICS BAYS

PART NUMBER: ADS.ADT.AD.AS

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

LOSS OF TRANSDUCER DATA.

DATE: 7/31/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: 3/1R MDAC ID: 1655 ABORT: 3/1R

ITEM: ADDRESSABLE SWITCH

FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) AIR DATA TRANSDUCER ASSEMBLY
- 5) A/D CONVERTER

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE HDW/FUNC ABORT HDW/FUNC PRELAUNCH: RTLS: 3/1R TAL: 3/1R LIFTOFF: AOA: 3/1R ONORBIT: 3/1R ATO: DEORBIT: / LANDING/SAFING: 3/3

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: FORWARD AVIONICS BAYS

PART NUMBER: ADS.ADT.AD.AS

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

LOSS OF TRANSDUCER DATA.

HIGHEST CRITICALITY HDW/FUNC DATE: 7/31/87

SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: 3/1R 1656 ABORT: 3/1R MDAC ID:

AMP ITEM:

FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- AIR DATA SUBSYSTEM 2)
- 3) ELECTRICAL
- 4) AIR DATA TRANSDUCER ASSEMBLY
- A/D CONVERTER
- 6)
- 7)
- 8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	7	RTLS:	3/1R
LIFTOFF:	7	TAL:	3/1R
ONORBIT:	7	AOA:	3/1R
DEORBIT:	3/1R	ATO:	,
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: FORWARD AVIONICS BAYS

PART NUMBER: ADS.ADT.AD.AMP

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

LOSS OF TRANSDUCER DATA.

HIGHEST CRITICALITY HDW/FUNC 7/31/87 DATE: FLIGHT: 3/1R SUBSYSTEM: MECH/ADP/EPD&C 3/1R ABORT: MDAC ID: 1657 ITEM: AMP FAILURE MODE: FAILS OPEN LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) AIR DATA SUBSYSTEM 3) ELECTRICAL 4) AIR DATA TRANSDUCER ASSEMBLY A/D CONVERTER 5) 6) 7) 8) 9)

CRITICALITIES

HDW/FUNC ABORT FLIGHT PHASE HDW/FUNC PRELAUNCH: RTLS: 3/1R / TAL: 3/1R LIFTOFF: 3/1R AOA: ONORBIT: DEORBIT: 3/1R ATO: LANDING/SAFING: 3/3

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: FORWARD AVIONICS BAYS

PART NUMBER: ADS.ADT.AD.AMP

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

LOSS OF TRANSDUCER DATA.

HIGHEST CRITICALITY HDW/FUNC 7/31/87 DATE: SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: 3/1R ABORT: 3/1R MDAC ID: 1658 SWITCHING LADDER ITEM: FAILURE MODE: FAILS SHORTED LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM AIR DATA SUBSYSTEM 2) 3) ELECTRICAL AIR DATA TRANSDUCER ASSEMBLY 4) A/D CONVERTER 6) 7) 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE RTLS: 3/1R ---PRELAUNCH: / 3/1R LIFTOFF: / AOA: ONORBIT: 3/1R 3/1R ATO: DEORBIT: LANDING/SAFING: 3/3 REDUNDANCY SCREENS: A [2] B [F] C [P] LOCATION: FORWARD AVIONICS BAYS PART NUMBER: ADS.ADT.AD.SL CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE:

REFERENCES:

LOSS OF TRANSDUCER DATA.

DATE: 7/31/87 HIGHEST CRITICALITY HDW/FUNC SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: 3/1R 3/1R ABORT: MDAC ID: 1659 SWITCHING LADDER ITEM: FAILURE MODE: FAILS OPEN LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) AIR DATA SUBSYSTEM 3) ELECTRICAL 4) AIR DATA TRANSDUCER ASSEMBLY 5) A/D CONVERTER 6) 7) 8) 9) CRITICALITIES ABORT FLIGHT PHASE HDW/FUNC HDW/FUNC PRELAUNCH: RTLS: 3/1R LIFTOFF: TAL: 3/1R ONORBIT: AOA: 3/1R DEORBIT: 3/1R ATO: LANDING/SAFING: 3/3

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: FORWARD AVIONICS BAYS

PART NUMBER: ADS.ADT.AD.SL

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

LOSS OF TRANSDUCER DATA.

HIGHEST CRITICALITY HDW/FUNC 7/31/87 DATE: FLIGHT: 3/1R SUBSYSTEM: MECH/ADP/EPD&C ABORT: 3/1R MDAC ID: 1660 POLARITY DETECTOR ITEM: FAILURE MODE: FAILS SHORTED The second secon SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: A.D. MONTGOMERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- AIR DATA TRANSDUCER ASSEMBLY 4)
- A/D CONVERTER 5)

6)

7)

8) 9)

CRITICALITIES

71,44471244			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	1	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/ :
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: FORWARD AVIONICS BAYS

PART NUMBER: ADS.ADT.AD.PD

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

LOSS OF TRANSDUCER DATA.

DATE: 7/31/87 HIGHEST CRITICALITY HDW/FUNC SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: 3/1R

MDAC ID: 1661 ABORT: 3/1R

ITEM: POLARITY DETECTOR

FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

1) MECHANICAL ACTUATION SYSTEM

2) AIR DATA SUBSYSTEM

3) ELECTRICAL

4) AIR DATA TRANSDUCER ASSEMBLY

5) A/D CONVERTER

6)

7)

8)

9)

CRITICALITIES

ABORT HDW/FUNC HDW/FUNC FLIGHT PHASE 3/1R PRELAUNCH: RTLS: / 3/1R TAL: LIFTOFF: 3/1R ONORBIT: AOA: 3/1R ATO: DEORBIT: 3/3 LANDING/SAFING:

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: FORWARD AVIONICS BAYS

PART NUMBER: ADS.ADT.AD.PD

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

LOSS OF TRANSDUCER DATA.

HIGHEST CRITICALITY HDW/FUNC DATE: 7/31/87 FLIGHT: SUBSYSTEM: MECH/ADP/EPD&C 3/1R 3/1R ABORT: MDAC ID: 1662 CONTROL LOGIC ITEM: FAILURE MODE: FAILS SHORTED LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) AIR DATA SUBSYSTEM ELECTRICAL 3) AIR DATA TRANSDUCER ASSEMBLY 4) A/D CONVERTER 6) 7) 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE RTLS: 3/1R PRELAUNCH: 3/1R TAL: LIFTOFF: 1 AOA: 3/1R

ATO:

REDUNDANCY SCREENS: A [2] B [F] C [P]

3/1R

LOCATION: FORWARD AVIONICS BAYS

LANDING/SAFING: 3/3

PART NUMBER: ADS.ADT.AD.CL

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

LOSS OF TRANSDUCER DATA.

ONORBIT:

DEORBIT:

HIGHEST CRITICALITY HDW/FUNC 7/31/87 DATE: 3/1R FLIGHT: MECH/ADP/EPD&C SUBSYSTEM: 3/1R ABORT: MDAC ID: 1663 CONTROL LOGIC ITEM: FAILURE MODE: FAILS OPEN SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: A.D. MONTGOMERY BREAKDOWN HIERARCHY: MECHANICAL ACTUATION SYSTEM 2) AIR DATA SUBSYSTEM 3) ELECTRICAL AIR DATA TRANSDUCER ASSEMBLY 4) A/D CONVERTER 5) 6) 7) 8) 9) CRITICALITIES

HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE RTLS: 3/1R PRELAUNCH: 3/1R TAL: LIFTOFF: 3/1R AOA: ONORBIT: 3/1R ATO: DEORBIT: 3/3 LANDING/SAFING:

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: FORWARD AVIONICS BAYS

PART NUMBER: ADS.ADT.AD.CL

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

LOSS OF TRANSDUCER DATA.

HIGHEST CRITICALITY HDW/FUNC DATE: 7/31/87 FLIGHT: 3/1R SUBSYSTEM: MECH/ADP/EPD&C 3/1R 1664 ABORT: MDAC ID:

ITEM: REGISTER

FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- AIR DATA SUBSYSTEM 2)
- 3) ELECTRICAL
- AIR DATA TRANSDUCER ASSEMBLY 4)
- A/D CONVERTER
- 6)
- 7) 8)
- 9)

CRITICALITIES

V1/4 - 4 V1.00 - 0 - 0 - 0 - 0 - 0 - 0 - 0 - 0 - 0		
HDW/FUNC	ABORT	HDW/FUNC
/	RTLS:	3/1R
/	TAL:	3/1R
/	AOA:	3/1R
3/1R	ATO:	/
3/3	# # · · · · · · · · ·	•
	/ / / 3/1R	/ RTLS: / TAL: / AOA: 3/1R ATO:

REDUNDANCY SCREENS: A [2] B [F] C [P]

FORWARD AVIONICS BAYS LOCATION:

PART NUMBER: ADS.ADT.AD.REG

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

LOSS OF TRANSDUCER DATA.

7/31/87 HIGHEST CRITICALITY HDW/FUNC DATE: FLIGHT: 3/1R SUBSYSTEM: MECH/ADP/EPD&C 3/1R ABORT: 1665 MDAC ID: ITEM: REGISTER FAILURE MODE: FAILS OPEN LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) AIR DATA SUBSYSTEM 3) ELECTRICAL 4) AIR DATA TRANSDUCER ASSEMBLY 5) A/D CONVERTER 6) 7) 8) 9) CRITICALITIES HDW/FUNC FLIGHT PHASE HDW/FUNC ABORT

PRELAUNCH: / RTLS: 3/1R LIFTOFF: / TAL: 3/1R ONORBIT: / AOA: 3/1R

ONORBIT: / AOA: 3/1R DEORBIT: 3/1R ATO: /

LANDING/SAFING: 3/3

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: FORWARD AVIONICS BAYS

PART NUMBER: ADS.ADT.AD.REG

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

LOSS OF TRANSDUCER DATA.

HIGHEST CRITICALITY HDW/FUNC 7/31/87 DATE: SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: 3/1R 3/1R ABORT: MDAC ID: 1666 DISCREET INPUT BUFFER ITEM: FAILURE MODE: FAILS SHORTED LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) AIR DATA SUBSYSTEM 3) ELECTRICAL 4) AIR DATA TRANSDUCER ASSEMBLY 5) 6) 7) 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE RTLS: TAL: PRELAUNCH: / 3/1R // 3/1R LIFTOFF: AOA: 3/1R ONORBIT: 3/1R ATO: DEORBIT: / LANDING/SAFING: 3/3 REDUNDANCY SCREENS: A [2] B [F] C [P] FORWARD AVIONICS BAYS LOCATION: PART NUMBER: ADS.ADT.DIB CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: LOSS OF TRANSDUCER DATA.

HIGHEST CRITICALITY HDW/FUNC DATE: 7/31/87 3/1R FLIGHT: SUBSYSTEM: MECH/ADP/EPD&C ABORT: 3/1R MDAC ID: 1667 DISCREET INPUT BUFFER ITEM: FAILURE MODE: FAILS OPEN SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: A.D. MONTGOMERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM AIR DATA SUBSYSTEM 2) ELECTRICAL 3) AIR DATA TRANSDUCER ASSEMBLY 4) 6) 7) 8) 9) CRITICALITIES HDW/FUNC FLIGHT PHASE HDW/FUNC ABORT 3/1R RTLS: PRELAUNCH: 3/1R 1. TAL: LIFTOFF: 3/1R AOA: ONORBIT: 3/1R ATO: DEORBIT: LANDING/SAFING: 3/3 REDUNDANCY SCREENS: A [2] B [F] C [P] FORWARD AVIONICS BAYS LOCATION:

PART NUMBER: ADS.ADT.DIB

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

LOSS OF TRANSDUCER DATA.

HIGHEST CRITICALITY HDW/FUNC 7/31/87 DATE: FLIGHT: 3/1R SUBSYSTEM: MECH/ADP/EPD&C ABORT: 3/1R MDAC ID: 1668 SERIAL/PARALLEL CONVERTER ITEM: FAILURE MODE: FAILS SHORTED LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM AIR DATA SUBSYSTEM 2) 3) ELECTRICAL AIR DATA TRANSDUCER ASSEMBLY 4) 5) 6) 7) 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE RTLS: TAL: AOA: 3/1R PRELAUNCH: / 3/1R LIFTOFF: ONORBIT: DEORBIT: 3/1R LANDING/SAFING: 3/3 ATO: REDUNDANCY SCREENS: A [2] B [F] C [P] LOCATION: FORWARD AVIONICS BAYS PART NUMBER: ADS.ADT.SPC CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE:

LOSS OF TRANSDUCER DATA.

HIGHEST CRITICALITY HDW/FUNC 7/31/87 DATE: 3/1R FLIGHT: SUBSYSTEM: MECH/ADP/EPD&C 3/1R ABORT: 1669 MDAC ID: SERIAL/PARALLEL CONVERTER ITEM: FAILURE MODE: FAILS OPEN SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: A.D. MONTGOMERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) AIR DATA SUBSYSTEM 3) ELECTRICAL AIR DATA TRANSDUCER ASSEMBLY 4) 5) 6) 7) 8) 9) CRITICALITIES ABORT HDW/FUNC FLIGHT PHASE HDW/FUNC 3/1R RTLS: PRELAUNCH: 3/1R TAL: LIFTOFF: 3/1R AOA: ONORBIT: ATO: 3/1R DEORBIT: LANDING/SAFING: 3/3

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: FORWARD AVIONICS BAYS

PART NUMBER: ADS.ADT.SPC

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

LOSS OF TRANSDUCER DATA.

HIGHEST CRITICALITY HDW/FUNC 7/31/87 DATE: FLIGHT: 3/1R SUBSYSTEM: MECH/ADP/EPD&C

ABORT: 3/1R MDAC ID: 1670

OSCILLATOR ITEM: FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

1) MECHANICAL ACTUATION SYSTEM

2) AIR DATA SUBSYSTEM

3) ELECTRICAL

4) AIR DATA TRANSDUCER ASSEMBLY

CLOCK GENERATOR

6) 7)

8) 9)

CRITICALITIES

HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE RTLS: 3/1R PRELAUNCH: / TAL: 3/1R LIFTOFF: AOA: 3/1R ONORBIT: 3/1R DEORBIT: ATO: LANDING/SAFING: 3/3

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: FORWARD AVIONICS BAYS

PART NUMBER: ADS.ADT.CG.OSC

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

LOSS OF TRANSDUCER DATA.

HIGHEST CRITICALITY HDW/FUNC 7/31/87 DATE: 3/1R FLIGHT: SUBSYSTEM: MECH/ADP/EPD&C

3/1R ABORT: MDAC ID: 1671

OSCILLATOR ITEM: FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- AIR DATA TRANSDUCER ASSEMBLY 4)
- CLOCK GENERATOR 5)
- 6)
- 7)
- 8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	,	TAL:	3/1R
ONORBIT:	,	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: FORWARD AVIONICS BAYS

PART NUMBER: ADS.ADT.CG.OSC

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

LOSS OF TRANSDUCER DATA.

HIGHEST CRITICALITY HDW/FUNC DATE: 7/31/87 3/1R SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: ABORT: 3/1R MDAC ID: 1672 ITEM: 2 MH2 CLOCK FAILURE MODE: FAILS SHORTED LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM AIR DATA SUBSYSTEM 2) 3) ELECTRICAL AIR DATA TRANSDUCER ASSEMBLY 4) 5) CLOCK GENERATOR 6) 7) 8)

CRITICALITIES

HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE 3/1R PRELAUNCH: RTLS: / 3/1R / TAL: LIFTOFF: AOA: 3/1R ONORBIT: 3/1R ATO: DEORBIT: / LANDING/SAFING: 3/3

REDUNDANCY SCREENS: A [2] B [F] C [P]

FORWARD AVIONICS BAYS LOCATION:

PART NUMBER: ADS.ADT.CG.2CL

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

LOSS OF TRANSDUCER DATA.

REFERENCES:

9)

HDW/FUNC HIGHEST CRITICALITY 7/31/87 FLIGHT: 3/1R SUBSYSTEM: MECH/ADP/EPD&C ABORT: 3/1R 1673 MDAC ID: 2 MH2 CLOCK ITEM: FAILURE MODE: FAILS OPEN LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) AIR DATA SUBSYSTEM ELECTRICAL 3) AIR DATA TRANSDUCER ASSEMBLY 4) CLOCK GENERATOR 5) 6) 7) 8) 9)

CRITICALITIES

HDW/FUNC HDW/FUNC ABORT FLIGHT PHASE 3/1R PRELAUNCH: RTLS: 1 3/1R TAL: LIFTOFF: AOA: 3/1R ONORBIT: 3/1R ATO: DEORBIT: LANDING/SAFING: 3/3

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: FORWARD AVIONICS BAYS

PART NUMBER: ADS.ADT.CG.2CL

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

LOSS OF TRANSDUCER DATA.

HIGHEST CRITICALITY HDW/FUNC 7/31/87 DATE: FLIGHT: 3/1R SUBSYSTEM: MECH/ADP/EPD&C ABORT: 3/1R MDAC ID: 1674 ITEM: 1 MH2 CLOCK FAILURE MODE: FAILS SHORTED រាប់ពីប្រែក្រុម ម៉េស្ SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: A.D. MONTGOMERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) AIR DATA SUBSYSTEM 3) ELECTRICAL
4) AIR DATA TRANSDUCER ASSEMBLY 5) CLOCK GENERATOR 6) 7) 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE RTLS: TAL: AOA: 3/1R / PRELAUNCH: 3/1R LIFTOFF: 3/1R ONORBIT: 3/1R ATO: DEORBIT: LANDING/SAFING: 3/3 REDUNDANCY SCREENS: A [2] B [F] C [P] LOCATION: FORWARD AVIONICS BAYS PART NUMBER: ADS.ADT.CG.1CL CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: LOSS OF TRANSDUCER DATA.

HIGHEST CRITICALITY HDW/FUNC DATE: 7/31/87 3/1R SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: 3/1R ABORT:

MDAC ID: 1675

1 MH2 CLOCK ITEM: FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- AIR DATA SUBSYSTEM 2)
- ELECTRICAL 3)
- AIR DATA TRANSDUCER ASSEMBLY 4)
- CLOCK GENERATOR
- 6)
- 7)
- 8) 9)

CRITICALITIES

HDW/FUNC	ABORT	HDW/FUNC
	RTLS:	3/1R
7	TAL:	3/1R
,	AOA:	3/1R
3/1R	ATO:	/
3/3		
	/ / 3/1R	/ RTLS: / TAL: / AOA: 3/1R ATO:

REDUNDANCY SCREENS: A [2] B [F] C [P]

FORWARD AVIONICS BAYS LOCATION:

PART NUMBER: ADS.ADT.CG.1CL

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

LOSS OF TRANSDUCER DATA.

DATE: 7/31/87 HIGHEST CRITICALITY HDW/FUNC SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: 3/1R FLIGHT: 3/1R ABORT: 3/1R MDAC ID: 1676 500 MH2 CLOCK ITEM: FAILURE MODE: FAILS SHORTED LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY anomie s BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) AIR DATA SUBSYSTEM 3) ELECTRICAL 4) AIR DATA TRANSDUCER ASSEMBLY 5) CLOCK GENERATOR 6) 7) 8) 9) CRITICALITIES FLIGHT PHASE HDW/FUNC ABORT HDW/FUNC RTLS: 3/1R
TAL: 3/1R
AOA: 3/1R
ATO: / / PRELAUNCH: 1 LIFTOFF: 3/1R ONORBIT: 3/1R DEORBIT: LANDING/SAFING: 3/3 REDUNDANCY SCREENS: A [2] B [F] C [P] LOCATION: FORWARD AVIONICS BAYS PART NUMBER: ADS.ADT.CG.5CL CAUSES: PIECE-PART STRUCTURAL FAILURE

REFERENCES:

EFFECTS/RATIONALE:

LOSS OF TRANSDUCER DATA.

HIGHEST CRITICALITY HDW/FUNC DATE: 7/31/87 FLIGHT: 3/1R SUBSYSTEM: MECH/ADP/EPD&C 3/1R ABORT: MDAC ID: 1677 500 MH2 CLOCK ITEM: FAILURE MODE: FAILS OPEN LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM AIR DATA SUBSYSTEM 2) ELECTRICAL 3) 4) AIR DATA TRANSDUCER ASSEMBLY CLOCK GENERATOR 5) 6) 7) 8) 9) CRITICALITIES

	CHITTCHDITTED			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	1	RTLS:	3/1R	
LIFTOFF:	,	TAL:	3/1R	
ONORBIT:	./	AOA:	3/1R	
DEORBIT:	3/1R	ATO:	/ .	
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [2] B [F] C [P]

FORWARD AVIONICS BAYS LOCATION:

PART NUMBER: ADS.ADT.CG.5CL

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

LOSS OF TRANSDUCER DATA.

HIGHEST CRITICALITY HDW/FUNC DATE: 7/31/87 SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: 3/1RABORT: 3/1R MDAC ID: 1678 COUNTER ITEM: FAILURE MODE: FAILS SHORTED LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM AIR DATA SUBSYSTEM 2) ELECTRICAL 3) AIR DATA TRANSDUCER ASSEMBLY 4) 5) CLOCK GENERATOR 6) 7)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	7	TAL:	3/1R
ONORBIT:	/.	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/3		·

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: FORWARD AVIONICS BAYS

PART NUMBER: ADS.ADT.CG.CNT

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

LOSS OF TRANSDUCER DATA.

REFERENCES:

8) 9)

DATE: 7/31/87 HIGHEST CRITICALITY HDW/FUNC SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: 3/1R MDAC ID: 1679 ABORT: 3/1R

ITEM: COUNTER FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) AIR DATA TRANSDUCER ASSEMBLY
- 5) CLOCK GENERATOR

6) 7)

8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	,	RTLS:	3/1R	
LIFTOFF:	<i>'</i> /	TAL:	3/1R	
ONORBIT:	,	AOA:	3/1R	
DEORBIT:	3/1R	ATO:	/	
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: FORWARD AVIONICS BAYS

PART NUMBER: ADS.ADT.CG.CNT

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

LOSS OF TRANSDUCER DATA.

HIGHEST CRITICALITY HDW/FUNC 7/31/87 DATE: FLIGHT: 3/1R SUBSYSTEM: MECH/ADP/EPD&C ABORT: 3/1R MDAC ID: 1680 ITEM: OR GATE FAILURE MODE: FAILS SHORTED LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) AIR DATA SUBSYSTEM 3) ELECTRICAL 4) AIR DATA TRANSDUCER ASSEMBLY 5) CLOCK GENERATOR 6) 7) 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE RTLS: TAL: AOA: 3/1R 😘 🚌 PRELAUNCH: / 3/1R / LIFTOFF: 3/1R ONORBIT: 3/1R ATO: DEORBIT: LANDING/SAFING: 3/3 REDUNDANCY SCREENS: A [2] B [F] C [P] LOCATION: FORWARD AVIONICS BAYS PART NUMBER: ADS.ADT.CG.OG CAUSES: PIECE-PART STRUCTURAL FAILURE

REFERENCES:

EFFECTS/RATIONALE:

LOSS OF TRANSDUCER DATA.

HIGHEST CRITICALITY HDW/FUNC 7/31/87 DATE: FLIGHT: 3/1R SUBSYSTEM: MECH/ADP/EPD&C 3/1R ABORT: 1681 MDAC ID: OR GATE ITEM: FAILURE MODE: FAILS OPEN SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: A.D. MONTGOMERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) AIR DATA SUBSYSTEM 3) ELECTRICAL AIR DATA TRANSDUCER ASSEMBLY 4) CLOCK GENERATOR 5) 6) 7) 8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	./	RTLS:	3/1R	
LIFTOFF:	/	TAL:	3/1R	
ONORBIT:	1	AOA:	3/1R	
DEORBIT:	3/1R	ATO:	· /	
LANDING/SAFING:	•		·	

REDUNDANCY SCREENS: A [2] B [F] C [P]

FORWARD AVIONICS BAYS LOCATION:

PART NUMBER: ADS.ADT.CG.OG

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

LOSS OF TRANSDUCER DATA.

HIGHEST CRITICALITY HDW/FUNC 7/31/87 DATE: FLIGHT: 3/1R SUBSYSTEM: MECH/ADP/EPD&C ABORT: 3/1R MDAC ID: 1682 SENSOR WINDOW GENERATOR ITEM: FAILURE MODE: FAILS SHORTED LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) AIR DATA SUBSYSTEM 3) ELECTRICAL AIR DATA TRANSDUCER ASSEMBLY 4) CLOCK GENERATOR 6) 7) 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC RTLS: 3/1R
TAL: 3/1R
AOA: 3/1R FLIGHT PHASE PRELAUNCH: / // LIFTOFF: ONORBIT: DEORBIT: 3/1R ATO: LANDING/SAFING: 3/3 REDUNDANCY SCREENS: A [2] B [F] C [P] LOCATION: FORWARD AVIONICS BAYS PART NUMBER: ADS.ADT.CG.SWG CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: LOSS OF TRANSDUCER DATA.

HIGHEST CRITICALITY HDW/FUNC DATE: 7/31/87 FLIGHT: 3/1R ABORT: 3/1R SUBSYSTEM: MECH/ADP/EPD&C MDAC ID: 1683

SENSOR WINDOW GENERATOR

FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) AIR DATA TRANSDUCER ASSEMBLY
- CLOCK GENERATOR 5)
- 6)

ITEM:

- 7)
- 8) 9)

CRITICALITIES `

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	<i>'</i> /	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	<i>'</i> /	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	•		*

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: FORWARD AVIONICS BAYS

PART NUMBER: ADS.ADT.CG.SWG

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

LOSS OF TRANSDUCER DATA.

HIGHEST CRITICALITY HDW/FUNC 7/31/87 DATE: FLIGHT: 3/1R SUBSYSTEM: MECH/ADP/EPD&C 3/1R ABORT: MDAC ID: 1684 BUFFER ITEM: FAILURE MODE: FAILS SHORTED LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) AIR DATA SUBSYSTEM 3) ELECTRICAL 4) AIR DATA TRANSDUCER ASSEMBLY DIGITAL OUTPUT 5) 6) 7) 8) 9) CRITICALITIES

HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE RTLS: 3/1R PRELAUNCH: / 3/1R / TAL: LIFTOFF: AOA: 3/1R ONORBIT: 3/1R ATO: DEORBIT: LANDING/SAFING: 3/3

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: FORWARD AVIONICS BAYS

PART NUMBER: ADS.ADT.DO.BUF

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

LOSS OF TRANSDUCER DATA.

HIGHEST CRITICALITY HDW/FUNC 7/31/87 DATE: FLIGHT: 3/1R SUBSYSTEM: MECH/ADP/EPD&C 3/1R ABORT: MDAC ID: 1685

BUFFER ITEM: FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- AIR DATA SUBSYSTEM 2)
- ELECTRICAL 3)
- AIR DATA TRANSDUCER ASSEMBLY 4)
- DIGITAL OUTPUT 5)
- 6)
- 7)
- 8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	7	RTLS:	3/1R	
LIFTOFF:	7	TAL:	3/1R	
ONORBIT:	7	AOA:	3/1R	
DEORBIT:	3/1R	ATO:	/	
LANDING/SAFING:	3/3			

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: FORWARD AVIONICS BAYS

PART NUMBER: ADS.ADT.DO.BUF

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

LOSS OF TRANSDUCER DATA.

HIGHEST CRITICALITY HDW/FUNC 7/31/87 DATE: SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: 3/1R ABORT: 3/1R MDAC ID: 1686 OUTPUT CONTROL ITEM: FAILURE MODE: FAILS SHORTED LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) AIR DATA SUBSYSTEM 3) ELECTRICAL 4) AIR DATA TRANSDUCER ASSEMBLY 5) DIGITAL OUTPUT 6) 7) 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE RTLS: 3/1R
TAL: 3/1R
AOA: 3/1R
ATO: / PRELAUNCH: / // LIFTOFF: ONORBIT: DEORBIT: 3/1R LANDING/SAFING: 3/3 REDUNDANCY SCREENS: A [2] B [F] C [P] LOCATION: FORWARD AVIONICS BAYS PART NUMBER: ADS.ADT.DO.OC CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: LOSS OF TRANSDUCER DATA.

HIGHEST CRITICALITY HDW/FUNC 7/31/87 DATE: 3/1R FLIGHT: SUBSYSTEM: MECH/ADP/EPD&C 3/1R ABORT: MDAC ID: 1687 OUTPUT CONTROL ITEM: FAILURE MODE: FAILS OPEN LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: MECHANICAL ACTUATION SYSTEM 2) AIR DATA SUBSYSTEM 3) ELECTRICAL AIR DATA TRANSDUCER ASSEMBLY 4) 5) DIGITAL OUTPUT 6) 7) 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE RTLS: 3/1R PRELAUNCH: 3/1R / TAL: LIFTOFF: AOA: . 3/1R ONORBIT: 3/1R ATO: DEORBIT: LANDING/SAFING: 3/3

REDUNDANCY SCREENS: A [2] B [F] C [P]

FORWARD AVIONICS BAYS LOCATION:

PART NUMBER: ADS.ADT.DO.OC

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

LOSS OF TRANSDUCER DATA.

DATE:

7/31/87

HIGHEST CRITICALITY HDW/FUNC

Miller of the Control

MDAC ID:

SUBSYSTEM: MECH/ADP/EPD&C

FLIGHT: 3/1R

1688

ABORT:

3/1R

ITEM:

ENCODER

FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) AIR DATA TRANSDUCER ASSEMBLY
- 5) DIGITAL OUTPUT

6)

7)

8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	/	, AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: FORWARD AVIONICS BAYS

PART NUMBER: ADS.ADT.DO.ENC

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

LOSS OF TRANSDUCER DATA.

DATE: 7/31/87 HIGHEST CRITICALITY HDW/FUNC FLIGHT: SUBSYSTEM: MECH/ADP/EPD&C 3/1R ABORT: 3/1R MDAC ID: 1689 ITEM: ENCODER FAILURE MODE: FAILS OPEN LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) AIR DATA SUBSYSTEM ELECTRICAL 3) AIR DATA TRANSDUCER ASSEMBLY 4) DIGITAL OUTPUT 5) 6) 7) 8) 9) CRITICALITIES FLIGHT PHASE HDW/FUNC HDW/FUNC ABORT 3/1R RTLS: PRELAUNCH:

FLIGHT PHASE HDW/FUNC ABORT HDW/FUNC
PRELAUNCH: / RTLS: 3/1R
LIFTOFF: / TAL: 3/1R
ONORBIT: / AOA: 3/1R
DEORBIT: 3/1R ATO: /
LANDING/SAFING: 3/3

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: FORWARD AVIONICS BAYS

PART NUMBER: ADS.ADT.DO.ENC

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

LOSS OF TRANSDUCER DATA.

HIGHEST CRITICALITY HDW/FUNC 7/31/87 DATE: SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: 3/1R ABORT: 3/1R MDAC ID: 1690

AMP ITEM:

FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) AIR DATA TRANSDUCER ASSEMBLY
- DIGITAL OUTPUT

6)

7)

8) 9)

CRITICALITIES

HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE 3/1R RTLS: PRELAUNCH: / 1 TAL: 3/1R LIFTOFF: AOA: 3/1R ONORBIT: ATO: 3/1R DEORBIT: LANDING/SAFING: 3/3

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: FORWARD AVIONICS BAYS

PART NUMBER: ADS.ADT.DO.AMP

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

LOSS OF TRANSDUCER DATA.

HIGHEST CRITICALITY HDW/FUNC DATE: 7/31/87 3/1R SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: 3/1R ABORT: MDAC ID: 1691 ITEM: AMP FAILURE MODE: FAILS OPEN LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM AIR DATA SUBSYSTEM 2) ELECTRICAL 3) AIR DATA TRANSDUCER ASSEMBLY 4) DIGITAL OUTPUT 5) 6) 7) 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE / RTLS: 3/1R PRELAUNCH: 3/1R TAL: LIFTOFF: AOA: 3/1R ONORBIT: 3/1R ATO: DEORBIT: LANDING/SAFING: 3/3 A[2] B[F] C[P] REDUNDANCY SCREENS: FORWARD AVIONICS BAYS LOCATION: PART NUMBER: ADS.ADT.DO.AMP CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

LOSS OF TRANSDUCER DATA.

DATE:

7/31/87

HIGHEST CRITICALITY HDW/FUNC

MDAC ID:

SUBSYSTEM: MECH/ADP/EPD&C 1692

FLIGHT: ABORT:

3/1R 3/1R

ITEM:

CPU

FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) AIR DATA TRANSDUCER ASSEMBLY
- 5) DIGITAL OUTPUT

6)

7)

8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	7	RTLS:	3/1R
LIFTOFF:	./	TAL:	3/1R
ONORBIT:	,	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/3	· · ·	

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: FORWARD AVIONICS BAYS

PART NUMBER: ADS.ADT.DO.CPU

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

LOSS OF TRANSDUCER DATA.

DATE: 7/31/87 HIGHEST CRITICALITY HDW/FUNC SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: 3/1R MDAC ID: 1693 ABORT: 3/1R

ITEM: CPU
FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

1) MECHANICAL ACTUATION SYSTEM

2) AIR DATA SUBSYSTEM

3) ELECTRICAL

4) AIR DATA TRANSDUCER ASSEMBLY

5) DIGITAL OUTPUT

6)

7)

8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	,	RTLS:	3/1R
LIFTOFF:	7	TAL:	3/1R
ONORBIT:	7	AOA:	3/1R
DEORBIT:	3/1R	ATO:	. /
LANDING/SAFING:	3/3	•	

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: FORWARD AVIONICS BAYS

PART NUMBER: ADS.ADT.DO.CPU

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

LOSS OF TRANSDUCER DATA.

HIGHEST CRITICALITY HDW/FUNC 7/31/87 DATE: FLIGHT: 3/1R SUBSYSTEM: MECH/ADP/EPD&C ABORT: 3/1R MDAC ID: 1694 SELECTOR LOGIC ITEM: FAILURE MODE: FAILS SHORTED LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) AIR DATA SUBSYSTEM

3) ELECTRICAL AIR DATA TRANSDUCER ASSEMBLY 4) DIGITAL PROCESSOR 5) 6)

7) 8) 9)

CRITICALITIES

HDW/FUNC	ABORT	HDW/FUNC	
/	RTLS:	3/1R	
1	TAL:	3/1R	
7	AOA:	3/1R	
3/1R	ATO:	/	
3/3			
	/ / 3/1R	/ RTLS: / TAL: / AOA: 3/1R ATO:	

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: FORWARD AVIONICS BAYS

PART NUMBER: ADS.ADT.DP.SL

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

LOSS OF TRANSDUCER DATA.

DATE: 7/31/87 HIGHEST CRITICALITY HDW/FUNC SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: 3/1R

MDAC ID: 1695 ABORT: 3/1R

ITEM: SELECTOR LOGIC FAILURE MODE: FAILS OPEN

LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) AIR DATA SUBSYSTEM
- 3) ELECTRICAL
- 4) AIR DATA TRANSDUCER ASSEMBLY
- 5) DIGITAL PROCESSOR

6)

7)

8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/1R
LIFTOFF:	/	TAL:	3/1R
ONORBIT:	. /	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: FORWARD AVIONICS BAYS

PART NUMBER: ADS.ADT.DP.SL

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

LOSS OF TRANSDUCER DATA.

HIGHEST CRITICALITY HDW/FUNC 7/31/87 DATE: FLIGHT: 3/1R SUBSYSTEM: MECH/ADP/EPD&C ABORT: 3/1R MDAC ID: 1696 ITEM: READ ONLY MEMORY FAILURE MODE: FAILS SHORTED LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) AIR DATA SUBSYSTEM 3) ELECTRICAL 4) AIR DATA TRANSDUCER ASSEMBLY DIGITAL PROCESSOR 6) 7) 8) 9) CRITICALITIES ABORT HDW/FUNC FLIGHT PHASE HDW/FUNC RTLS: 3/1R PRELAUNCH: TAL: 3/1R LIFTOFF: 3/1R AOA: ONORBIT: 3/1R ATO: DEORBIT: LANDING/SAFING: 3/3 REDUNDANCY SCREENS: A [2] B [F] C [P] LOCATION: FORWARD AVIONICS BAYS PART NUMBER: ADS.ADT.DP.ROM

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

LOSS OF TRANSDUCER DATA.

HIGHEST CRITICALITY HDW/FUNC 7/31/87 DATE: FLIGHT: 3/1R SUBSYSTEM: MECH/ADP/EPD&C ABORT: 3/1R MDAC ID: 1697 ITEM: ROM FAILURE MODE: FAILS OPEN LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) AIR DATA SUBSYSTEM 3) ELECTRICAL 4) AIR DATA TRANSDUCER ASSEMBLY DIGITAL PROCESSOR 5) 6) 7) 8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	,	RTLS:	3/1R
LIFTOFF:	/	TAL: .	3/1R
ONORBIT:	,	AOA:	3/1R
DEORBIT:	3/1R	ATO:	/
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: FORWARD AVIONICS BAYS

PART NUMBER: ADS.ADT.DP.ROM

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

LOSS OF TRANSDUCER DATA.

HIGHEST CRITICALITY HDW/FUNC 7/31/87 DATE: SUBSYSTEM: MECH/ADP/EPD&C FLIGHT: 3/1R ABORT: 3/1R 1698 MDAC ID: READ/WRITE MEMORY ITEM: FAILURE MODE: FAILS SHORTED SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: A.D. MONTGOMERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) AIR DATA SUBSYSTEM 3) ELECTRICAL AIR DATA TRANSDUCER ASSEMBLY 4)

DIGITAL PROCESSOR 5) 6) 7)

8) 9)

CRITICALITIES

HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE RTLS: TAL: AOA: 3/1R PRELAUNCH: / 1 3/1R LIFTOFF: 3/1R ONORBIT: DEORBIT: 3/1R ATO: / LANDING/SAFING: 3/3

REDUNDANCY SCREENS: A [2] B [F] C [P]

FORWARD AVIONICS BAYS LOCATION:

PART NUMBER: ADS.ADT.DP.RWM

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

LOSS OF TRANSDUCER DATA.

HIGHEST CRITICALITY HDW/FUNC 7/31/87 FLIGHT: 3/1R SUBSYSTEM: MECH/ADP/EPD&C 3/1R ABORT: MDAC ID: 1699 READ/WRITE MEMORY ITEM: FAILURE MODE: FAILS OPEN LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) AIR DATA SUBŞYSTEM 3) ELECTRICAL 4) AIR DATA TRANSDUCER ASSEMBLY 5) DIGITAL PROCESSOR 6) 7) 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE RTLS: TAL: AOA: 3/1R PRELAUNCH: . / 3/1R LIFTOFF: 3/1R ONORBIT: 3/1R ATO: DEORBIT: LANDING/SAFING: 3/3 REDUNDANCY SCREENS: A [2] B [F] C [P] LOCATION: FORWARD AVIONICS BAYS PART NUMBER: ADS.ADT.DP.RWM

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

LOSS OF TRANSDUCER DATA.

C.2

ELEVON SEALS PANEL ANALYSIS WORKSHEETS

ELEVON SEALS PANEL ANALYSIS WORKSHEETS SUMMARY

MDAC-ID	CRITIC FLIGHT H/F	ALITY ABORT H/F	SCREENS A B C	ITEM NAME
2100 * 2101 * 2102 * 2103 * 2104 * 2105 * 2106	1/1 1/1 1/1 1/1 1/1 1/1 1/1 3/3	1/1 1/1 1/1 1/1 1/1 1/1 3/3		ROD ASSEMBLY ROD ASSEMBLY BELLCRANK BELLCRANK BOLT BOLT ALL ITEMS NOT SHOWN ON MDAC ID

^(*) Potential Critical Items.

6/16/87 HIGHEST CRITICALITY HDW/FUNC DATE: SUBSYSTEM: MECH/ESP FLIGHT: 1/1 1/1 ABORT: MDAC ID: 2100 ROD ASSEMBLY ITEM: FAILURE MODE: PHYSICAL BINDING/JAMMING, LINKAGE IN OPERABLE, BENT, BROKEN, DEBRIS OR FROZEN BEARING SURFACE LEAD ANALYST: H.J. LOWERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM ELEVON SEAL PANEL LINKAGE 2) ROD ASSEMBLY 3) 4) 5) 6) 7) 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE PRELAUNCH: 1/1 2/2 RTLS: LIFTOFF: 2/2 TAL: 1/1 ONORBIT: 2/2 AOA: 1/1 ATO: DEORBIT: 1/1 1/1 LANDING/SAFING: 3/3 B[] C[] REDUNDANCY SCREENS: A [] OUTBOARD ELEVON SEAL PANELS LOCATION: PART NUMBER: V070-596009-007/008, 10-001/013, 70-001/005, 77-001 (42 TOTAL) CAUSES: OVERLOAD, PIECE-PART FAILURE, STRUCTURAL FAILURE EFFECTS/RATIONALE: ELEVON SPAR AND FITTINGS LOOSE STRUCTURAL CAPABILITY BECAUSE OF OVER HEATING. FRACTURED COMPONENTS RUPTURE THE HYDRAULIC LINES OR SHORT-OUT/SEVER THE ELECTRICAL CABLES OR COMPONENTS, THUS ORBITER EXPERIENCES LOSS OF: ELEVONS, HYDRAULIC FLUID, CONTROL, VEHICLES/CREW. REFERENCES: V070-596008

HIGHEST CRITICALITY HDW/FUNC DATE: 6/16/87 MECH/ESP 1/1 FLIGHT: SUBSYSTEM: 1/1 ABORT: MDAC ID: 2101 ROD ASSEMBLY ITEM: PHYSICAL BINDING/JAMMING, LINKAGE IN OPERABLE, FAILURE MODE: BENT, BROKEN, DEBRIS OR FROZEN BEARING SURFACE SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM ELEVON SEAL PANEL LINKAGE ROD ASSEMBLY 3) 4) 5) 6) 7) 8)

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	~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	2/2	RTLS:	1/1
LIFTOFF:	2/2	TAL:	1/1
ONORBIT:	2/2	AOA:	1/1
DEORBIT:	1/1	ATO:	1/1
LANDING/SAFING	: 3/3		

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: INBOARD ELEVON SEAL PANELS

PART NUMBER: V070-596003-001/016, 80-001/007, 82-001/004, 87-

001/007 (50 TOTAL)

9)

CAUSES: OVERLOAD, PIECE-PART FAILURE, STRUCTURAL FAILURE

EFFECTS/RATIONALE:

ELEVON SPAR AND FITTINGS LOOSE STRUCTURAL CAPABILITY BECAUSE OF OVER HEATING. FRACTURED COMPONENTS RUPTURE THE HYDRAULIC LINES OR SHORT-OUT/SEVER THE ELECTRICAL CABLES OR COMPONENTS, THUS ORBITER EXPERIENCES LOSS OF: ELEVONS, HYDRAULIC FLUID, CONTROL, VEHICLES/CREW.

REFERENCES: V070-596001

HIGHEST CRITICALITY HDW/FUNC DATE: 6/16/87 SUBSYSTEM: MECH/ESP FLIGHT: 1/1 MDAC ID: 2102 ABORT: 1/1 ITEM: BELLCRANK FAILURE MODE: PHYSICAL BINDING/JAMMING, LINKAGE IN OPERABLE, BENT, BROKEN, DEBRIS OR FROZEN BEARING SURFACE SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) ELEVON SEAL PANEL LINKAGE 3) BELLCRANKS 4) 5) 6) 7) 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC

2/2 RTLS: 1/1

2/2 TAL: 1/1

2/2 AOA: 1/1 FLIGHT PHASE 2/2 2/2 PRELAUNCH: LIFTOFF: ONORBIT: ATO: DEORBIT: 1/1 1/1 LANDING/SAFING: 3/3 REDUNDANCY SCREENS: A [] B [] C [] OUTBOARD ELEVON SEAL PANELS LOCATION: PART NUMBER: V070-596011-001/4, 12-005/006, 14-001/002, 22-001/002, 23-001/006 (16 TOTAL) CAUSES: OVERLOAD, PIECE-PART FAILURE, STRUCTURAL FAILURE EFFECTS/RATIONALE: ELEVON SPAR AND FITTINGS LOOSE STRUCTURAL CAPABILITY BECAUSE OF OVER HEATING. FRACTURED COMPONENTS RUPTURE THE HYDRAULIC LINES OR SHORT-OUT/SEVER THE ELECTRICAL CABLES OR COMPONENTS, THUS ORBITER EXPERIENCES LOSS OF: ELEVONS, HYDRAULIC FLUID, CONTROL, VEHICLES/CREW. REFERENCES: V070-596008

DATE: 6/16/87 HIGHEST CRITICALITY HDW/FUNC SUBSYSTEM: MECH/ESP FLIGHT: 1/1 MDAC ID: 2103 ABORT: 1/1

ITEM: BELLCRANK

FAILURE MODE: PHYSICAL BINDING/JAMMING, LINKAGE IN OPERABLE,

BENT, BROKEN, DEBRIS OR FROZEN BEARING SURFACE

LEAD ANALYST: H.J. LOWERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) ELEVON SEAL PANEL LINKAGE
- 3) BELLCRANKS

4)

5)

6)

7)

8) 9)

CRITICALITIES

HDW/FUNC	ABORT	HDW/FUNC
2/2	RTLS:	1/1
2/2	TAL:	1/1
2/2	AOA:	1/1
1/1	ATO:	1/1
3/3		
	2/2 2/2 2/2 1/1	2/2 RTLS: 2/2 TAL: 2/2 AOA: 1/1 ATO:

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: INBOARD ELEVON SEAL PANELS

PART NUMBER: V070-596004-001/002, 005-001/006, 006-001/002, 007-001/002, 024-001/002, 025-001/002, 026-001/002, 027-001/002, 028-001/002 (18 TOTAL)

CAUSES: OVERLOAD, PIECE-PART FAILURE, STRUCTURAL FAILURE

EFFECTS/RATIONALE:

ELEVON SPAR AND FITTINGS LOOSE STRUCTURAL CAPABILITY BECAUSE OF OVER HEATING. FRACTURED COMPONENTS RUPTURE THE HYDRAULIC LINES OR SHORT-OUT/SEVER THE ELECTRICAL CABLES OR COMPONENTS, THUS ORBITER EXPERIENCES LOSS OF: ELEVONS, HYDRAULIC FLUID, CONTROL, VEHICLES/CREW.

REFERENCES: V070-596001

HIGHEST CRITICALITY HDW/FUNC DATE: 6/16/87 FLIGHT: 1/1 SUBSYSTEM: MECH/ESP 1/1 ABORT: MDAC ID: 2104 BOLT TTEM: FAILURE MODE: PHYSICAL BINDING/JAMMING, LINKAGE IN OPERABLE, BENT, BROKEN, DEBRIS OR FROZEN BEARING SURFACE LEAD ANALYST: H.J. LOWERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) ELEVON SEAL PANEL LINKAGE 3) BOLTS 4) 5) 6) 7) 8) 9) CRITICALITIES

FLIGHT PHASE HDW/FUNC ABORT HDW/FUNC
PRELAUNCH: 2/2 RTLS: 1/1
LIFTOFF: 2/2 TAL: 1/1
ONORBIT: 2/2 AOA: 1/1
DEORBIT: 1/1 ATO: 1/1 LANDING/SAFING: 3/3 REDUNDANCY SCREENS: A [] B [] C [] LOCATION: OUTBOARD ELEVON SEAL PANELS PART NUMBER: V070-596083-001-4; MD111-1001-0416, 18, 19; 0515-19, 0616-18, 22; MD111-1002-0413 (100 TOTAL) CAUSES: OVERLOAD, PIECE-PART FAILURE, STRUCTURAL FAILURE EFFECTS/RATIONALE: ELEVON SPAR AND FITTINGS LOOSE STRUCTURAL CAPABILITY BECAUSE OF OVER HEATING. FRACTURED COMPONENTS RUPTURE THE HYDRAULIC LINES OR SHORT-OUT/SEVER THE ELECTRICAL CABLES OR COMPONENTS, THUS ORBITER EXPERIENCES LOSS OF: ELEVONS, HYDRAULIC FLUID, CONTROL, VEHICLES/CREW. REFERENCES: V070-596008

HIGHEST CRITICALITY HDW/FUNC DATE: 6/16/87 1/1 FLIGHT: SUBSYSTEM: MECH/ESP ABORT: 1/1 2105 MDAC ID: ITEM: BOLT PHYSICAL BINDING/JAMMING, LINKAGE IN OPERABLE, FAILURE MODE: BENT, BROKEN, DEBRIS OR FROZEN BEARING SURFACE SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) ELEVON SEAL PANEL LINKAGE 3) BOLTS 4) 5) 6) 7) 8)

CRITICALITIES

	V-1		
FLIGHT PHASE H	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	2/2	RTLS:	1/1
LIFTOFF:	2/2	TAL:	1/1
ONORBIT:	2/2	AOA:	1/1
DEORBIT:	1/1	ATO:	1/1
LANDING/SAFING:	3/3		· · · · · · · ·

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: INBOARD ELEVON SEAL PANELS

PART NUMBER: V070-596083-001-4; MD111-1001-0418, 19, -0516-18, 23, 27, -0616, 18, 22, 27; MD111-1002-0517 (118 TOTAL)

CAUSES: OVERLOAD, PIECE-PART FAILURE, STRUCTURAL FAILURE

EFFECTS/RATIONALE:

9)

ELEVON SPAR AND FITTINGS LOOSE STRUCTURAL CAPABILITY BECAUSE OF OVER HEATING. FRACTURED COMPONENTS RUPTURE THE HYDRAULIC LINES OR SHORT-OUT/SEVER THE ELECTRICAL CABLES OR COMPONENTS, THUS ORBITER EXPERIENCES LOSS OF: ELEVONS, HYDRAULIC FLUID, CONTROL, VEHICLES/CREW.

REFERENCES: V070-596001

HIGHEST CRITICALITY HDW/FUNC DATE: 6/16/87 FLIGHT: 3/3 SUBSYSTEM: MECH/ESP ABORT: 3/3 MDAC ID: 2106 ALL ITEMS NOT SHOWN ON MDAC ID 100-105 (WASHER, ITEM: BUSHING, NUT, COTTER PIN, SAFETY WIRE, ETC) FAILURE MODE: ALL FAILURE MODES SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM ELEVON SEAL PANEL LINKAGE 3) ALL REMAINING PARTS 4) 5) 6) 7) 8) 9) CRITICALITIES FLIGHT PHASE HDW/FUNC ABORT HDW/FUNC
PRELAUNCH: 3/3 RTLS: 3/3
LIFTOFF: 3/3 TAL: 3/3
ONORBIT: 3/3 AOA: 3/3 DEORBIT: 3/3 ATO: 3/3 LANDING/SAFING: 3/3 REDUNDANCY SCREENS: A [] B [] C [] LOCATION: INBOARD/OUTBOARD ELEVON SEAL PANELS PART NUMBER: ALL PARTS NOT SHOWN ON MDAC ID 100-105 CAUSES: ALL CAUSES EFFECTS/RATIONALE: FAILURE OF ALL PARTS NOT SHOWN ON MDAC ID 100-105 WILL HAVE NO EFFECT ON MISSION, VEHICLE OR CREW.

C.3

ET UMBILICAL ANALYSIS WORKSHEETS

ET UMBILICAL ANALYSIS WORKSHEETS SUMMARY

	CRITIC	ALITY	REDUND	ANCY	
	FLIGHT	ABORT	SCREE	NS	
MDAC-ID	H/F	H/F	A B	С	ITEM NAME
3101 *	2/1R	2/1R	P P	p	CENTERLINE LATCH MOTOR
3102 *	2/1R	2/1R			CENTERLINE MOTOR CLUTCH
3103	3/3	3/3		_	CENTERLINE MOTOR CLUTCH
3104	3/3	3/3			CENTERLINE MOTOR BRAKE
3105 *	2/1R	2/1R	PР	P	CENTERLINE MOTOR BRAKE
3106 *	1/1	1/1		_	CL LATCH DIFFERENTIAL/GEARBOX
3107 *	1/1	1/1			CL LATCH DIFFERENTIAL/GEARBOX
3108 *	1/1	1/1			CENTERLINE LATCH
3109 *	2/1R	2/1R	PР	P	CENTERLINE LATCH LIMIT SWITCH
3110	3/3	3/3			CENTERLINE LATCH LIMIT SWITCH
3111 *	2/1R	2/1R	P P	P	DOOR CLOSURE MOTOR
3112 *	2/1R	2/1R			DOOR CLOSURE MOTOR CLUTCH
3113	3/3	3/3			DOOR CLOSURE MOTOR CLUTCH
3114	3/3	3/3			DOOR CLOSURE MOTOR BRAKE
3115 *	2/1R	2/1R	PР	P	DOOR CLOSURE MOTOR BRAKE
3116 *	1/1	1/1			TLC/DIFFERENTIAL/GEARBOX
3117 *	1/1	1/1			TLC/DIFFERENTIAL/GEARBOX
3118 *	1/1	1/1			DOOR LINKAGE ASSEMBLY
3119 *	1/1	1/1			DOOR LINKAGE ASSEMBLY
3120 *	1/1	1/1			HINGE LINKAGE ASSEMBLY
3121 *	1/1	1/1			HINGE LINKAGE ASSEMBLY
3122 *	1/1	1/1			CLOSURE TORQUE TUBE ASSEMBLY
3123 *	1/1	1/1			CLOSURE TORQUE TUBE ASSEMBLY
3124 *	2/1R	2/1R	PР	P	DOOR CLOSURE LIMIT SWITCH
3125	3/3	3/3			DOOR CLOSURE LIMIT SWITCH
3126 *	1/1	1/1			DOOR HINGE
3127 *	1/1	1/1			DOOR HINGE
3128 *	1/1	1/1			DOOR UPLATCH ROLLER
3129 *	1/1	1/1			UMBILICAL DOOR
3130 *	2/1R	2/1R	PΡ	P	UPLOCK LATCH MOTOR
3131 *	2/1R	2/1R	PΡ	P	UPLATCH MOTOR CLUTCH
3132	3/3	3/3			UPLATCH MOTOR CLUTCH
3133	3/3	3/3			UPLATCH MOTOR BRAKE
3134 *	2/1R	2/1R	PΡ	P	UPLATCH MOTOR BRAKE
3135 *	1/1	1/1			TLC/DIFFERENTIAL/GEARBOX
3136 *	1/1	1/1			TLC/DIFFERENTIAL/GEARBOX
3137 *	1/1	1/1			UPLATCH TORQUE TUBE ASSEMBLY
3138 *	1/1	1/1			UPLATCH TORQUE TUBE ASSEMBLY
3139 *	1/1	1/1			INBOARD UPLOCK LATCH LINKAGE
3140 *		1/1			INBOARD UPLOCK LATCH LINKAGE
3141 *	1/1	1/1			UPLOCK LATCH MECHANISM
3142 *		1/1			UPLOCK LATCH MECHANISM
3143 *		2/1R	PF	P	READY TO LATCH LIMIT SWITCH
3144	3/3	3/3			READY TO LATCH LIMIT SWITCH
3501 *	2/1R	2/1R	P F	P 	RELAY

^(*) Potential Critical Items.

ET UMBILICAL ANALYSIS WORKSHEETS SUMMARY

MDAC-ID	CRITIC FLIGHT H/F	ALITY ABORT H/F	REDUNDANCY SCREENS A B C	ITEM NAME
3502 3503 * 3504	3/3 2/1R 3/3	3/3 2/1R 3/3	PFP	RELAY RELAY RELAY
3505 3506 3507 * 3508	3/3 3/3 2/1R 3/3	3/3 3/3 2/1R 3/3	ррр	ET UMBILICAL DOOR MODE SWITCH ET UMBILICAL DOOR MODE SWITCH CENTERLINE LATCH-STOW SWITCH CENTERLINE LATCH-STOW SWITCH
3509 * 3510 3511 *	2/1R 3/3 2/1R	2/1R 3/3 2/1R	P P P	ETUD OPEN-CLOSE SWITCH ETUD OPEN-CLOSE SWITCH ETUD OPEN-CLOSE SWITCH
3512 * 3513 3514 *	2/1R 3/3 2/1R	2/1R 3/3 2/1R	P P P P P P	ETUD LATCH-RELEASE SWITCH ETUD LATCH-RELEASE SWITCH ETUD LATCH-RELEASE SWITCH
3515 * 3516 * 3517 *	2/1R 2/1R 2/1R	2/1R 2/1R 2/1R	P F P P P P P P P	MCA AC POWER CIRCUIT BREAKER MCA RELAY LOGIC POWER SWITCH
3518 3519 * 3520	3/3 2/1R 3/3	3/3 2/1R 3/3	P F P	MCA RELAY LOGIC POWER SWITCH REMOTE POWER CONTROLLER HYBRID CIRCUIT DRIVER HYBRID CIRCUIT DRIVER
3521 3522 * 3523	3/3 2/1R 3/3	3/3 2/1R 3/3	F F P P F P	DIODE DIODE RESISTOR, 5.1K 1/4W
3524 * 3525 * 3526 * 3527 *	2/1R 2/1R 2/1R 2/1R	•	F F P F F P P F P	
3528 * 3529 *	2/1R 2/1R	2/1R 2/1R	P F P P F P	RESISTOR, 1.2K, MCA LOGIC SW RESISTOR, 1.2K, MCA LOGIC SW

^(*) Potential Critical Items.

HIGHEST CRITICALITY HDW/FUNC DATE: 6/16/87 FLIGHT: 2/1R SUBSYSTEM: MECH/ETUD ABORT: 2/1R MDAC ID: 3101 CENTERLINE LATCH MOTOR ITEM: FAILURE MODE: FAILS TO START LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) ET UMBILICAL DOOR MECHANISM 3) CENTERLINE LATCH MECHANISM 4) CENTERLINE LATCH MOTOR 5) 6) 7) 8) CRITICALITIES HDW/FUNC ABORT HDW/FUN
/ RTLS: 2/1R
/ TAL: 2/1R
/ AOA: 2/1R FLIGHT PHASE HDW/FUNC PRELAUNCH: LIFTOFF: 2/1R ONORBIT: 2/1R ATO: DEORBIT: / LANDING/SAFING: / REDUNDANCY SCREENS: A [2] B [P] C [P] LOCATION: AFT FUSELAGE PART NUMBER: CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE, LOSS OF OUTPUT, VIBRATION EFFECTS/RATIONALE: LOSS OF A CENTERLINE LATCH MOTOR WOULD RESULT IN SECOND MOTOR STOWING THE LATCH AT A REDUCED RATE. LOSS OF SECOND MOTOR WOULD PREVENT STOWING CENTERLINE LATCH AND CLOSING OF UMBILICAL DOOR.

REFERENCES: JSC-11174

DATE: 6/16/87 HIGHEST CRITICALITY HDW/FUNC SUBSYSTEM: MECH/ETUD FLIGHT: 2/1R MDAC ID: 3102 ABORT: 2/1R

ITEM:

CENTERLINE MOTOR CLUTCH

FAILURE MODE: FAILS TO ENGAGE

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) ET UMBILICAL DOOR MECHANISM
- 3) CENTERLINE LATCH MECHANISM
- 4) CENTERLINE MOTOR CLUTCH
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	./	RTLS:	2/1R
LIFTOFF:	7	TAL:	2/1R
ONORBIT:	<i>'</i> /	AOA:	2/1R
DEORBIT:	2/1R	ATO:	/
LANDING/SAFI	NG: /		

Lending bin indi

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:

AFT FUSELAGE

PART NUMBER:

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE, ACCELERATION, LOSS OF INPUT, VIBRATION

EFFECTS/RATIONALE:

FAILURE OF CLUTCH TO ENGAGE WOULD REDUCE POWER TRANSFER FOR LATCH STOWING. REDUNDANT MOTOR WOULD STOW LATCH BUT AT A REDUCED RATE.

DATE: 6/16/87 SUBSYSTEM: MECH/ETUD MDAC ID: 3103	HIGHEST	CRITICALITY FLIGHT: ABORT:	HDW/FUN 3/3 3/3
ITEM: CENTERLINE MOTOR CLUFALLURE MODE: FAILS TO DISENGAGE	UTCH	· = TFTE: (FL)	
LEAD ANALYST: J. BACHER SUBS	YS LEAD:	H.J. LOWERY	
BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) ET UMBILICAL DOOR MECHANISM 3) CENTERLINE LATCH MECHANISM 4) CENTERLINE MOTOR CLUTCH 5) 6) 7) 8)	en e		
	LITIES		
FLIGHT PHASE HDW/FUNC PRELAUNCH: / LIFTOFF: / ONORBIT: / DEORBIT: 3/3 LANDING/SAFING: /	RT: TA: AO	LS: 3/3 L: 3/3	
REDUNDANCY SCREENS: A []	в[]	. c []	
LOCATION: AFT FUSELAGE PART NUMBER:			
CAUSES: CONTAMINATION, MECHANICAL ACCELERATION, LOSS OF INPUT, VIBRA	SHOCK, P	IECE-PART FAI	LURE,
EFFECTS/RATIONALE: CLUTCH FAILING TO DISENGAGE WOULD I RELEASE AND STOWING WOULD BE COMPLI ORBITER/CREW OR MISSION.			тсн

DATE: 6/16/87 SUBSYSTEM: MECH/ETUD MDAC ID: 3104			RITICALITY FLIGHT: ABORT:	HDW/FUN 3/3 3/3
ITEM: CENTER! FAILURE MODE: FAILS	LINE MOTOR BRAI TO ENGAGE	KE		
LEAD ANALYST: J. BACHI	ER SUBSY:	5 LEAD: H.J	. LOWERY	
BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATOR 2) ET UMBILICAL DOOD 3) CENTERLINE LATCH 4) CENTERLINE MOTOR 5) 6) 7) 8) 9)	FION SYSTEM R MECHANISM MECHANISM			
	CRITICAL			
FLIGHT PHASE PRELAUNCH: LIFTOFF: ONORBIT: DEORBIT: LANDING/SAFING	/ / 3/3 .	ABORT RTLS: TAL: AOA: ATO:	: 3/3 3/3 3/3	IC
REDUNDANCY SCREENS:	A []	в[]	C []	
LOCATION: AFT FUS	ELAGE			
CAUSES: CONTAMINATION ACCELERATION, LOSS OF	N, MECHANICAL INPUT, VIBRAT	SHOCK, PIEC	CE-PART FAI	[LURE,
EFFECTS/RATIONALE: FAILURE OF BRAKE TO E POSITION COULD RESULT ORBITER/CREW OR MISSI	IN DAMAGE TO	CENTERLINI LATCH ON E	E LATCH IN NTRY. NO P	STOWED EFFECT ON
DEFEDENCES TCC_1117	4		-	

HIGHEST CRITICALITY HDW/FUNC 6/16/87 DATE: FLIGHT: 2/1R SUBSYSTEM: MECH/ETUD ABORT: 2/1R MDAC ID: 3105 CENTERLINE MOTOR BRAKE ITEM: FAILURE MODE: FAILS TO DISENGAGE

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- ET UMBILICAL DOOR MECHANISM 2)
- CENTERLINE LATCH MECHANISM
- CENTERLINE MOTOR BRAKE 4)

5)

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:		RTLS:	2/1R
LIFTOFF:	/	TAL:	2/1R
ONORBIT:	/	AOA:	2/1R
DEORBIT:	2/1R	ATO:	/
LANDING/SAFING	: /		. <u>.</u>

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION:

AFT FUSELAGE

PART NUMBER:

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE, ACCELERATION, LOSS OF INPUT, VIBRATION

EFFECTS/RATIONALE:

FAILURE OF BRAKE TO DISENGAGE WOULD REDUCE POWER TRANSFER FOR LATCH STOWING. REDUNDANT MOTOR WOULD STOW LATCH BUT AT A REDUCED RATE.

DATE: 6/16/87 SUBSYSTEM: MECH/ETUD MDAC ID: 3106	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 1/1 ABORT: 1/1			
ITEM: CENTERLINE LATCH DISTRIBUTE MODE: PHYSICAL BINDING/JA	FFERENTIAL/GEAR ASSEMBLY MMING			
LEAD ANALYST: J. BACHER SUBS	YS LEAD: H.J. LOWERY			
BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) ET UMBILICAL DOOR MECHANISM 3) CENTERLINE LATCH MECHANISM 4) CENTERLINE LATCH DIFFERENTIAL/GEAR ASSEMBLY 5) 6) 7) 8) 9)				
CRITICA	LITIES			
FLIGHT PHASE HDW/FUNC PRELAUNCH: / LIFTOFF: / ONORBIT: / DEORBIT: 1/1 LANDING/SAFING: /	ABORT HDW/FUNC RTLS: 1/1 TAL: 1/1 AOA: 1/1 ATO: /			
REDUNDANCY SCREENS: A []	B [] C []			
LOCATION: AFT FUSELAGE PART NUMBER:				
CAUSES: CONTAMINATION, MECHANICAL ACCELERATION, VIBRATION	SHOCK, PIECE-PART FAILURE,			
EFFECTS/RATIONALE: BINDING/JAMMING WOULD PREVENT CENT UMBILICAL DOOR FROM CLOSING. HEAT ON ENTRY. POSSIBLE LOSS OF CREW/V	COULD ENTER UMBILICAL CAVITY			

DATE: SUBS! MDAC	: YSTEM: ID:	6/16/87 MECH/ETUD 3107	1	HIGHEST	CRITICALITY FLIGHT: ABORT:	HDW/FUNC 1/1 1/1
ITEM: FAIL	RE MOD	CENTER E: PARTIA	LINE LATCH D L OUTPUT	IFFERENTIAL	/GEAR ASSEME	BLY
LEAD	ANALYS	T: J. BACH	ER SUB	SYS LEAD: H	.J. LOWERY	#14 B
1) 2) 3)	KDOWN H MECHAN ET UMB CENTER	IERARCHY: ICAL ACTUA ILICAL DOO LINE LATCH		n Karamatan Marin	i e iä viega MBLY	
			CRITIC	ALITIES		
1	PREL LIFT ONOR DEOR	PHASE AUNCH: OFF: BIT: BIT: ING/SAFING	CRITIC HDW/FUNC / / 1/1	ABORT RTI TAI AOA ATO	S: 1/1 : 1/1 : 1/1	IC
			A []	B []	c []	•
LOCA?	rion: number	AFT FUS	ELAGE		·	
CAUSI ACCEI	ES: CO	NTAMINATIO N, VIBRATI	N, MECHANICA ON	L SHOCK, PI	ECE-PART FAI	LURE,
PART:	IAL TRA	H STALL TI	OF MOTOR POW ME BEFORE LA RE. POSSIBL	TCH REACHES	STOWED POSI	TION
REFEI	RENCES:	JSC-1117	4			

DATE: 6/16/87 SUBSYSTEM: MECH/ETUD MDAC ID: 3108	·	HIGHEST	CRITICALITY FLIGHT: ABORT:	HDW/FUNC 1/1 1/1
ITEM: CENTERLINE FAILURE MODE: PHYSICAL B		IING		
LEAD ANALYST: J. BACHER	SUBSYS	E LEAD: H	.J. LOWERY	
BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION 2) ET UMBILICAL DOOR MEG 3) CENTERLINE LATCH MECH 4) CENTERLINE LATCH 5) 6) 7) 8) 9)	SYSTEM CHANISM HANISM			
	CRITICAL	TIES		
FLIGHT PHASE HDW	/FUNC	ABORT	HDW/FUN S: 1/1 : 1/1 : 1/1 : /	IC
PRELAUNCH:	/,	RTL	S: 1/1	
LIFTOFF:	/,	TAL	. 1/1 . 1/1	•
ONORBIT: DEORBIT: 1	/1	AUA ATO	• 1/1	
LANDING/SAFING:	/		,	
REDUNDANCY SCREENS: A [] 1	3 []	c []	
LOCATION: AFT FUSELAGE PART NUMBER: V070-565062	E -001/V070-!	565062-00	2	
CAUSES: MECHANICAL SHOCK VIBRATION	, PIECE-PAI	RT FAILUR	E, ACCELERAT	ion,
EFFECTS/RATIONALE: FAILURE OF LATCH ON ASCENT PREVENTS CLOSURE WHICH WO AFTER LATCH CLEARS DOOR ATTO AERODYNAMIC HEATING ON	ULD CAUSE I T WORST WO	LOSS OF O	RBITER/CREW.	FAILURE

HIGHEST CRITICALITY HDW/FUNC 6/16/87 DATE: FLIGHT: 2/1R SUBSYSTEM: MECH/ETUD ABORT: 2/1R MDAC ID: 3109 ITEM: CENTERLINE LATCH LIMIT SWITCH FAILURE MODE: PREMATURE OPERATION LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) ET UMBILICAL DOOR MECHANISM 3) CENTERLINE LATCH MECHANISM 4) CENTERLINE LATCH LIMIT SWITCH 5) 6) 7) 8) 9) FLIGHT PHASE CRITICALITIES HDW/FUNC ABORT HDW/FUNC
/ RTLS: 2/1R
/ TAL: 2/1R
/ AOA: 2/1R
2/1R ATO: / PRELAUNCH: LIFTOFF: DEORBIT: LANDING/SAFING: / REDUNDANCY SCREENS: A [2] B [P] C [P] LOCATION: AFT FUSELAGE PART NUMBER: CAUSES: CONTAMINATION, ERRONEOUS INPUT, MECHANICAL SHOCK, PIECE-PART FAILURE, VIBRATION, INADVERTENT OPERATION EFFECTS/RATIONALE: PREMATURE CLOSING OF CENTERLINE LATCH LIMIT SWITCH WOULD CAUSE MOTOR TO STOP. SECOND MOTOR WOULD STOW LATCH BUT AT A REDUCED RATE.

HIGHEST CRITICALITY HDW/FUNC 6/16/87 DATE: FLIGHT: 3/3 SUBSYSTEM: MECH/ETUD 3/3 ABORT: MDAC ID: 3110 CENTERLINE LATCH LIMIT SWITCH ITEM: FAILURE MODE: FAILS TO SWITCH SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: J. BACHER BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) ET UMBILICAL DOOR MECHANISM 3) CENTERLINE LATCH MECHANISM 4) CENTERLINE LATCH LIMIT SWITCH 5) 6) 7) 8) 9) CRITICALITIES HDW/FUNC HDW/FUNC ABORT FLIGHT PHASE RTLS: 3/3 PRELAUNCH: / TAL: 3/3 LIFTOFF: AOA: 3/3 ONORBIT: 3/3 ATO: DEORBIT: LANDING/SAFING: REDUNDANCY SCREENS: A [] B [] C [] AFT FUSELAGE LOCATION: PART NUMBER: CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE, LOSS OF INPUT, VIBRATION EFFECTS/RATIONALE: MOTOR WOULD CONTINUE TO OPERATE UNTIL LATCH REACHES LIMIT, MOTOR WOULD STALL. LATCH WOULD MOVE TO STOWED POSITION.

HIGHEST CRITICALITY HDW/FUNC DATE: 6/16/87 SUBSYSTEM: MECH/ETUD FLIGHT: 2/1R ABORT: 2/1R MDAC ID: 3111 DOOR CLOSURE MOTOR ITEM: FAILURE MODE: FAILS TO START

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM ET UMBILICAL DOOR MECHANISM
- 3) DOOR CLOSURE MECHANISM
- DOOR CLOSE MOTOR 4)

5)

6) 7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:		RTLS:	2/1R
LIFTOFF:	,	TAL:	2/1R
ONORBIT:	<i>'</i> /	AOA:	2/1R
DEORBIT:	2/1R	ATO:	,
LANDING/SAFING	: /		•

C [P] REDUNDANCY SCREENS: A [2] B [P]

LOCATION: AFT FUSELAGE

PART NUMBER:

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE,

LOSS OF INPUT, VIBRATION

EFFECTS/RATIONALE:

LOSS OF UMBILICAL DOOR CLOSURE MOTOR WOULD RESULT IN SECOND MOTOR CLOSING THE UMBILICAL DOOR AT A REDUCED RATE. LOSS OF SECOND MOTOR WOULD PREVENT CLOSING OF UMBILICAL DOOR.

HIGHEST CRITICALITY HDW/FUNC DATE: 6/16/87 2/1R SUBSYSTEM: MECH/ETUD FLIGHT: 2/1R ABORT: MDAC ID: 3112 DOOR CLOSURE MOTOR CLUTCH ITEM: FAILURE MODE: FAILS TO ENGAGE SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: J. BACHER BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) ET UMBILICAL DOOR MECHANISM 3) CENTERLINE LATCH MACHANISM

4) DOOR CLOSURE MOTOR CLUTCH
5)
6)
7)

8) 9)

CRITICALITIES

HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE / RTLS: 2/1R PRELAUNCH: TAL: 2/1R LIFTOFF: / 2/1R AOA: ONORBIT: 2/1R ATO: DEORBIT: LANDING/SAFING:

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: AFT FUSELAGE

PART NUMBER:

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE, ACCELERATION, LOSS OF INPUT, VIBRATION

EFFECTS/RATIONALE:

FAILURE OF CLUTCH TO ENGAGE WOULD REDUCE POWER TRANSFER FOR DOOR CLOSURE. REDUNDANT MOTOR WOULD CLOSE DOOR AT REDUCED RATE.

DATE: 6/16/87 SUBSYSTEM: MECH/ETUD MDAC ID: 3113		HIGHEST CRITICALITY FLIGHT: ABORT:	3/3 3/3
ITEM: DOOR CLOSU FAILURE MODE: FAILS TO D		CLUTCH	
LEAD ANALYST: J. BACHER	SUBS	SYS LEAD: H.J. LOWERY	
BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION 2) ET UMBILICAL DOOR ME 3) CENTERLINE LATCH MAC 4) DOOR CLOSURE MOTOR C 5) 6) 7) 8) 9)	CHANISM CHANISM		
·	CRITICA	ALITIES	
PRELAUNCH: LIFTOFF: ONORBIT: DEORBIT: 3		ABORT HDW/FUN RTLS: 3/3 TAL: 3/3 AOA: 3/3 ATO: /	
REDUNDANCY SCREENS: A []	B [] C []	
LOCATION: AFT FUSELAG PART NUMBER:	E		
CAUSES: CONTAMINATION, ME ACCELERATION, LOSS OF INP	CHANICAL UT, VIBRA	SHOCK, PIECE-PART FAIL	URE,
EFFECTS/RATIONALE: CLUTCH FAILING TO DISENGA DOOR CLOSURE WOULD BE COM MISSION.			
DEFEDENCES TSC-11174			

HIGHEST CRITICALITY HDW/FUNC 6/16/87 DATE: FLIGHT: 3/3 SUBSYSTEM: MECH/ETUD 3/3 ABORT: MDAC ID: DOOR CLOSURE MOTOR BRAKE ITEM: FAILURE MODE: FAILS TO ENGAGE SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: J. BACHER BREAKDOWN HIERARCHY: MECHANICAL ACTUATION SYSTEM 2) ET UMBILICAL DOOR MECHANISM CENTERLINE LATCH MACHANISM 3) 4) DOOR CLOSURE MOTOR BRAKE 5) 6) 7) 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE RTLS: 3/3 PRELAUNCH: 3/3 TAL: LIFTOFF: AOA: 3/3 ONORBIT: ATO: 3/3 DEORBIT: LANDING/SAFING: REDUNDANCY SCREENS: A [] B [] C [] LOCATION: AFT FUSELAGE PART NUMBER: CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE, ACCELERATION, LOSS OF INPUT, VIBRATION EFFECTS/RATIONALE: BRAKE FAILURE TO ENGAGE UPON DOOR CLOSURE WOULD HAVE NO EFFECT ON

REFERENCES: JSC-11174

ORBITER/CREW OR MISSION.

HIGHEST CRITICALITY HDW/FUNC 6/16/87 FLIGHT: 2/1R SUBSYSTEM: MECH/ETUD ABORT: 2/1R MDAC ID: 3115 ITEM: DOOR CLOSURE MOTOR BRAKE FAILURE MODE: FAILS TO DISENGAGE LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) ET UMBILICAL DOOR MECHANISM
- 3) CENTERLINE LATCH MACHANISM
- 4) DOOR CLOSURE MOTOR BRAKE

5)

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	,	RTLS:	2/1R
LIFTOFF:	7	TAL:	2/1R
ONORBIT:	,	AOA:	2/1R
DEORBIT:	2/1R	ATO:	
LANDING/SAFII	NG: /		-

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: AFT FUSELAGE

PART NUMBER:

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE, ACCELERATION, LOSS OF INPUT, VIBRATION

EFFECTS/RATIONALE:

FAILURE OF BRAKE TO DISENGAGE WOULD REDUCE POWER TRANSFER FOR UMBILICAL DOOR CLOSURE. REDUNDANT MOTOR WOULD CLOSE DOOR BUT AT A REDUCED RATE.

DATE: SUBSYSTEM: ME MDAC ID: 31	6/16/87 ECH/ETUD L16		HIGHES	T CRIT	ICALITY IGHT: ORT:	HDW/FUNC 1/1 1/1
ITEM: FAILURE MODE:				ENTIAL/	GEAR ASS	EMBLY
LEAD ANALYST:	J. BACHER	SUBSY	S LEAD:	н.ј.	LOWERY	
BREAKDOWN HIER 1) MECHANICA 2) ET UMBILE 3) CENTERLIN 4) TORQUE LE 5) 6) 7) 8)	AL ACTUATION ICAL DOOR ME NE LATCH MEC	CHANISM HANISM	AL/GEAF	R ASSEM	BLY	
		CRITICAL	LITIES			
LIFTOFI ONORBI DEORBI	ASE HDW NCH: F: I: I: 1 G/SAFING:	/FUNC / / / /1	ABOF F T	RT RTLS: FAL:	HDW/FUN 1/1 1/1 1/1	c
REDUNDANCY SCI	REENS: A []	в[]]	c []	
LOCATION: PART NUMBER:	AFT FUSELAG	E				
CAUSES: CONTRACCELERATION,	AMINATION, M VIBRATION	ECHANICAL	SHOCK,	PIECE-	PART FAI	LURE,
EFFECTS/RATION BINDING/JAMMINUMBILICAL CAV	NG WOULD PRE	VENT DOOR	CLOSURI CREW/V	E. ALL VEHICLE	OWS HEAT	TO ENTER

HIGHEST CRITICALITY HDW/FUNC DATE: 6/16/87 SUBSYSTEM: MECH/ETUD FLIGHT: 1/1 ABORT: 1/1 MDAC ID: 3117 TORQUE LIMIT CLUTCH/DIFFERENTIAL/GEAR ASSEMBLY ITEM: FAILURE MODE: PARTIAL OUTPUT LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM ET UMBILICAL DOOR MECHANISM 2) CENTERLINE LATCH MECHANISM TORQUE LIMIT CLUTCH/DIFFERENTIAL/GEAR ASSEMBLY 4) 5) 6) 7) 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE RTLS: / PRELAUNCH: 1/1 TAL: 1/1 LIFTOFF: AOA: 1/1 ONORBIT: DEORBIT: 1/1 ATO: LANDING/SAFING: / REDUNDANCY SCREENS: A [] B [] C [] LOCATION: AFT FUSELAGE PART NUMBER: CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE, PARTIAL INPUT, VIBRATION EFFECTS/RATIONALE: PARTIAL TRANSMISSION OF MOTOR POWER WOULD SLOW UMBILICAL DOOR CLOSURE. DOOR CLOSURE MOTORS REACH STALL TIME BEFORE DOOR CLOSED. IF UNABLE TO CLOSE DOOR THEN THE LOSS OF CREW/VEHICLE IS POSSIBLE. REFERENCES: JSC-11174

DATE: SUBS: MDAC		6/16/87 MECH/ETUD 3118		HIGHEST	CRITICALITY FLIGHT: ABORT:	HDW/FUNC 1/1 1/1
	: URE MOD		INKAGE ASSE AL BINDING/			
LEAD	ANALYS'	r: J. BACH	er su	BSYS LEAD:	H.J. LOWERY	
1) 2) 3)	MECHAN ET UMB CENTER	ILICAL DOO	IION SYSTEM R MECHANISM MECHANISM EMBLY			
			CRITI	CALITIES		
,	FLIGHT		HDW/FUNC	ABORT	HDW/FUN	IC
	;	AUNCH:	/,	RT	LS: 1/1 L: 1/1	
	LIFT	OFF: BIT:	/	TA AO	A: 1/1	
-	DEOR		1/1	AT		
		•	•		•	
REDU	NDANCY	SCREENS:	A []	B []	c []	
PART	NUMBER	AFT FUS : V070-56 5002-001/V		70-565001-0 002	01/V070565001	L -
CAUS		NTAMINATIO N, VIBRATI		CAL SHOCK, P	IECE-PART FA	LURE,
BIND	CTS/RAT ING/JAM RS UMBI	MING WOULD	PREVENT DO	OOT FROM BEI	NG CLOSED. I	HEAT

DATE: 6/16/87 SUBSYSTEM: MECH/ETUD MDAC ID: 3119	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 1/1 ABORT: 1/1
ITEM: DOOR LINKAGE ASSEMBLY FAILURE MODE: LINKAGE BROKEN/UNATTA	CHED '
LEAD ANALYST: J. BACHER SUBSYS	E LEAD: H.J. LOWERY
BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) ET UMBILICAL DOOR MECHANISM 3) CENTERLINE LATCH MECHANISM 4) DOOR LINKAGE ASSEMBLY 5) 6) 7) 8)	
CRITICAL	
FLIGHT PHASE HDW/FUNC PRELAUNCH: / LIFTOFF: / ONORBIT: / DEORBIT: 1/1 LANDING/SAFING: /	ABORT HDW/FUNC RTLS: 1/1 TAL: 1/1 AOA: 1/1 ATO: /
REDUNDANCY SCREENS: A []	3 [] C []
LOCATION: AFT FUSELAGE PART NUMBER: V070-565017-003/V070-5 002/V070-565002-001/V070-565002-002 CAUSES: MECHANICAL SHOCK, PIECE-PARACCELERATION, VIBRATION	· · · · · · · · · · · · · · · · · · ·
EFFECTS/RATIONALE: BROKEN/UNATTACHED DOOR LINKAGE PREVI CLOSURE BUT DOOR CANNOT SEAL OPENING UMBILICAL CAVITY DURING ENTRY. POSS	ALLOWING HEAT TO ENTER

HIGHEST CRITICALITY HDW/FUNC DATE: 6/16/87 FLIGHT: 1/1 SUBSYSTEM: MECH/ETUD 1/1 ABORT: MDAC ID: 3120 HINGE LINKAGE ASSEMBLY ITEM: FAILURE MODE: PHYSICAL BINDING/JAMMING SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: J. BACHER BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) ET UMBILICAL DOOR MECHANISM 3) CENTERLINE LATCH MECHANISM 4) HINGE LINKAGE ASSEMBLY 5) 6) 7) 8) 9) CRITICALITIES HDW/FUNC FLIGHT PHASE HDW/FUNC ABORT PRELAUNCH: RTLS: 1/1 TAL: 1/1 / LIFTOFF: AOA: 1/1 ONORBIT: ATO: DEORBIT: LANDING/SAFING: C [REDUNDANCY SCREENS: A [] B []] AFT FUSELAGE LOCATION: PART NUMBER: V070-565017-001/V070-565017-004 CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE, ACCELERATION, VIBRATION EFFECTS/RATIONALE: BINDING/JAMMING WOULD PREVENT DOOR FROM BEING CLOSED. UMBILICAL DOOR ALLOWS HEAT TO ENTER UMBILICAL CAVITY ON ENTRY. POSSIBLE LOSS OF CREW/VEHICLE.

DATE: 6/16/87 SUBSYSTEM: MECH/ETUD MDAC ID: 3121	HIGHEST CRITICALITY FLIGHT: ABORT:	HDW/FUNC 1/1 1/1
ITEM: HINGE LINKAGE ASSEMBLE FAILURE MODE: LINKAGE BROKEN/UNATTA		4
LEAD ANALYST: J. BACHER SUBSYS	LEAD: H.J. LOWERY	
4) HINGE LINKAGE ASSEMBLY	t time conservation of the second of the sec	·
5) 6) 7) 8) 9)		\$ *
CRITICAL	ITIES	
FLIGHT PHASE HDW/FUNC PRELAUNCH: / LIFTOFF: / ONORBIT: / DEORBIT: 1/1 LANDING/SAFING: /	ABORT HDW/FUNC RTLS: 1/1 TAL: 1/1 AOA: 1/1 ATO: /	2
REDUNDANCY SCREENS: A []	3 [] C []	
LOCATION: AFT FUSELAGE PART NUMBER: V070-565017-001/V070-5	565017-004	
CAUSES: MECHANICAL SHOCK, PIECE-PARVIBRATION	RT FAILURE, THERMAL SE	IOCK,
EFFECTS/RATIONALE: BROKEN/UNATTACHED HINGE LINKAGE PREVIOUSURE BUT DOOR CANNOT SEAL OPENING UMBILICAL CAVITY. POSSIBLE LOSS OF	ALLOWING HEAT TO ENT	ALLOWS

DATE: 6/16/87 SUBSYSTEM: MECH/ETUE MDAC ID: 3122	,)	HIGHEST	CRITICALITY FLIGHT: ABORT:	HDW/FUNC 1/1 1/1
ITEM: DOOR OF FAILURE MODE: PHYSIC	LOSURE TORQUE CAL BINDING/JA	TUBE ASSI MMING	EMBLY	
LEAD ANALYST: J. BACH	ier subs	YS LEAD: 1	H.J. LOWERY	
BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUA 2) ET UMBILICAL DOC 3) CENTERLINE LATCH 4) DOOR CLOSURE TOR 5) 6) 7) 8) 9)	OR MECHANISM H MECHANISM	MBLY		
	CRITICA	LITIES		
FLIGHT PHASE PRELAUNCH: LIFTOFF: ONORBIT: DEORBIT: LANDING/SAFING	/ / 1/1	ABORT RT: TA: AO: AT:	HDW/FUN LS: 1/1 L: 1/1 A: 1/1 O: /	I C
REDUNDANCY SCREENS:	A []	В[]	C []	
LOCATION: AFT FUS PART NUMBER: V070-50				
CAUSES: CONTAMINATION ACCELERATION, VIBRAT		SHOCK, PI	ECE-PART FAII	URE,
EFFECTS/RATIONALE: BINDING/JAMMING OF TO BECAUSE ALL DOOR CLOSE ENTRY HEAT COULD ENTE CREW/VEHICLE.	SURE LINKAGES	ARE DRIVE	N BY TORQUE I	TUBE. ON
REFERENCES: V070-56	500			

HIGHEST CRITICALITY HDW/FUNC DATE: 6/16/87 FLIGHT: 1/1 SUBSYSTEM: MECH/ETUD 1/1 ABORT: MDAC ID: 3123 DOOR CLOSURE TORQUE TUBE ASSEMBLY ITEM: FAILURE MODE: TORQUE TUBE BROKEN LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM ET UMBILICAL DOOR MECHANISM 2) CENTERLINE LATCH MECHANISM 3) DOOR CLOSURE TORQUE TUBE ASSEMBLY 4) 5) 6) 7) 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE RTLS: 1/1 PRELAUNCH: / 1 LIFTOFF: TAL: 1/1 AOA: 1/1 ONORBIT: DEORBIT: 1/1 ATO: / LANDING/SAFING: / REDUNDANCY SCREENS: A [] B [] C [] AFT FUSELAGE LOCATION: PART NUMBER: V070-565010 CAUSES: MECHANICAL SHOCK, PIECE-PART FAILURE, ACCELERATION, VIBRATION EFFECTS/RATIONALE: BROKEN TORQUE TUBE PREVENTS DOOR CLOSURE BECAUSE ALL LINKAGES ARE DRIVEN BY TORQUE TUBE. ON ENTRY HEAT COULD ENTER UMBILICAL CAVITY. LOSS OF CREW/VEHICLE.

DATE: 6/16/87 HIGHEST CRITICALITY HDW/FUNC SUBSYSTEM: MECH/ETUD FLIGHT: 2/1R MDAC ID: 3124 ABORT: 2/1R

ITEM: DO

DOOR CLOSURE LIMIT SWITCH

FAILURE MODE: PREMATURE OPERATION

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) ET UMBILICAL DOOR MECHANISM
- 3) DOOR CLOSURE MECHANISM
- 4) DOOR CLOSURE LIMIT SWITCH
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

	V112 = 200		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	./	RTLS:	2/1R
LIFTOFF:	,	TAL:	2/1R
ONORBIT:	,	AOA:	2/1R
DEORBIT:	2/1R	ATO:	/
LANDING/SAFI	NG: /		-

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION:

AFT FUSELAGE

PART NUMBER:

CAUSES: CONTAMINATION, ERRONEOUS INPUT, MECHANICAL SHOCK, PIECE-PART FAILURE, VIBRATION, INADVERTENT OPERATION

EFFECTS/RATIONALE:

PREMATURE CLOSING OF DOOR CLOSURE LIMIT SWITCH WOULD CAUSE MOTOR TO STOP. SECOND MOTOR WOULD CLOSE DOOR BUT AT A REDUCED RATE.

HIGHEST CRITICALITY HDW/FUNC DATE: 6/16/87 FLIGHT: 3/3 SUBSYSTEM: MECH/ETUD 3125 ABORT: 3/3 MDAC ID: DOOR CLOSURE LIMIT SWITCH ITEM: FAILURE MODE: FAILS TO SWITCH LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM ET UMBILICAL DOOR MECHANISM 3) DOOR CLOSURE MECHANISM DOOR CLOSURE LIMIT SWITCH 5) 6) 7) 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE RTLS: TAL: AOA: ATO: 3/3 PRELAUNCH: 3/3 LIFTOFF: 3/3 ONORBIT: DEORBIT: 3/3 LANDING/SAFING: / REDUNDANCY SCREENS: A [] B [] C [] LOCATION: AFT FUSELAGE PART NUMBER: CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE, LOSS OF INPUT, VIBRATION EFFECTS/RATIONALE: DOOR CLOSURE MOTOR WOULD NOT RECEIVE CUTOFF COMMAND WHEN UMBILICAL DOOR CLOSES. ALSO LOSE SIGNAL OF DOOR CLOSURE WITH APPLICABLE MISD SHOWING DOOR OPEN. PROCEDURE IS MANUAL ON NOMINAL MISSION AND AUTOMATIC DURING AN ABORT SO THERE IS NO EFFECT ON ORBITER/CREW OR MISSION.

DATE: 6/16/87 SUBSYSTEM: MECH/ETUD MDAC ID: 3126	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 1/1 ABORT: 1/1
ITEM: DOOR HINGE FAILURE MODE: PHYSICAL BINDING/JAN	MMING
LEAD ANALYST: J. BACHER SUBS	YS LEAD: H.J. LOWERY
BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) ET UMBILICAL DOOR MECHANISM 3) DOOR CLOSURE MECHANISM 4) DOOR HINGE 5) 6) 7) 8) 9)	
CRITICAL	LITIES
FLIGHT PHASE HDW/FUNC PRELAUNCH: / LIFTOFF: / ONORBIT: / DEORBIT: 1/1 LANDING/SAFING: /	ABORT HDW/FUNC RTLS: 1/1 TAL: 1/1 AOA: 1/1 ATO: /
REDUNDANCY SCREENS: A []	B [] C []
LOCATION: AFT FUSELAGE PART NUMBER: V070-565030-003	
CAUSES: CONTAMINATION, MECHANICAL ACCELERATION, VIBRATION	SHOCK, PIECE-PART FAILURE,
EFFECTS/RATIONALE: BINDING/JAMMING DOOR HINGE PREVENTS HEAT TO ENTER UMBILICAL CAVITY ON I	S DOOR CLOSURE. DOOR ALLOWS ENTRY. LOSS OF CREW/VEHICLE.

HIGHEST CRITICALITY HDW/FUNC 6/16/87 DATE: SUBSYSTEM: MECH/ETUD FLIGHT: 1/1 ABORT: 1/1 MDAC ID: 3127 DOOR HINGE ITEM: FAILURE MODE: STRUCTURAL FAILURE LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) ET UMBILICAL DOOR MECHANISM 3) DOOR CLOSURE MECHANISM DOOR HINGE 4) 5) 6) 7) 8) 9) CRITICALITIES HDW/FUNC HDW/FUNC ABORT FLIGHT PHASE RTLS: TAL: AOA: ATO: PRELAUNCH: 1/1 / 1/1 LIFTOFF: 1/1 ONORBIT: DEORBIT: 1/1 LANDING/SAFING: / REDUNDANCY SCREENS: A [] B [] C [] AFT FUSELAGE LOCATION: PART NUMBER: V070-565030-003 CAUSES: MECHANICAL SHOCK, STRUCTURAL FAILURE, THERMAL SHOCK, ACCELERATION, VIBRATION EFFECTS/RATIONALE: FAILURE OF A HINGE WOULD PREVENT DOOR CLOSURE OR NOT SEAL THE DOOR IN THE OPENING. HEAT COULD ENTER UMBILICAL CAVITY DURING ENTRY. POSSIBLE LOSS OF CREW/VEHICLE. REFERENCES: V070-565000

	6/16/87 4: MECH/ETUD 3128		HIGHEST C	RITICALITY FLIGHT: ABORT:	HDW/FUNC 1/1 1/1
		PLATCH ROLLER OFF DOOR COM		TIALLY	
LEAD ANA	LYST: J. BACH	ER SUBS	YS LEAD: H.	J. LOWERY	
1) MECI 2) ET 0 3) DOO	N HIERARCHY: HANICAL ACTUA' UMBILICAL DOO! R CLOSURE MEC! R UPLATCH ROL!	R MECHANISM HANISM			
		CRITICA	LITTES		
P: L: O: D:	HT PHASE RELAUNCH: IFTOFF: NORBIT: EORBIT: ANDING/SAFING	HDW/FUNC / / 1/1		1/1 1/1	°C
REDUNDAN	CY SCREENS:	A []	B []	c []	
		ELAGE 5160-001 & 00	2/V070-5651	66-001 & 00	2/1070-
CAUSES: VIBRATIO		HOCK, PIECE-P	ART FAILURE	, ACCELERAT	'ION,
COMPLETE DOOR INT	RATIONALE: OR PARTIAL L O PLACE. HEA CREW/VEHICLE.	OSS OF AN UPL T COULD ENTER	ATCH ON ASC UMBILICAL	ENT PREVENT CAVITY ON E	' LATCHING NTRY.

		- · · · · ·			
DATE: SUBSYSTEM MDAC ID:	6/16/8': MECH/ETUI 3129	7 0	HIGHEST	CRITICALITY FLIGHT: ABORT:	HDW/FUNC 1/1 1/1
ITEM: FAILURE MO	UMBIL: DDE: DAMAG	ICAL DOOR ED ON ASCENT			
LEAD ANALY	(ST: J. BAC	HER SUE	SSYS LEAD: H	.J. LOWERY	
1) MECHA 2) ET UI 3) CENTI	ARTITCAL DO	ATION SYSTEM OR MECHANISM H MECHANISM	gundek (j. 1947) Agrikanska	17 - 17 - 17 - 17 - 17 - 17 - 17 - 17 -	
		CRITTO	CALITIES		
PRI LII ONO DEC	T PHASE ELAUNCH: TTOFF: ORBIT: ORBIT: VDING/SAFING	HDW/FUNC / / 1/1	ABORT	HDW/FUN S: 1/1 : 1/1 : 1/1 : /	VC
REDUNDANC	SCREENS:	A []	B []	c []	
PART NUMBI	AFT FUS	SELAGE			
CAUSES: I	MECHANICAL S	SHOCK, STRUCT	URAL FAILUR	E, THERMAL S	SHOCK,
DAMAGE TO ALLOWS HE	AT TO ENTER	DOOR CAUSES I UMBILICAL CA CLOSE SECURE	VITY DUE TO	MISSING TIL	LES OR

HIGHEST CRITICALITY HDW/FUNC 6/17/87 DATE: SUBSYSTEM: MECH/ETUD FLIGHT: 2/1R ABORT: 2/1R 3130 MDAC ID:

UPLOCK LATCH MOTOR ITEM: FAILURE MODE: FAILS TO START

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- MECHANICAL ACTUATION SYSTEM
- ET UMBILICAL DOOR MECHANISM
- 3) UPLOCK LATCH MECHANISM
- 4) UPLOCK LATCH MOTOR

5)

6)

7)

8) 9)

CRITICALITIES

	V-1		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	,	RTLS:	2/1R
LIFTOFF:	,	TAL:	2/1R
ONORBIT:	,	AOA:	2/1R
DEORBIT:	2/1R	ATO:	/
LANDING/SAFI	NG: /		•

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: AFT FUSELAGE

PART NUMBER:

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE, LOSS OF INPUT, VIBRATION

EFFECTS/RATIONALE:

FAILURE OF UPLATCH MOTOR WOULD MEAN SECOND MOTOR WOULD LATCH DOORS SECURE AT A REDUCED RATE. ONLY EFFECT IS LOSS OF REDUNDANCY.

HIGHEST CRITICALITY HDW/FUNC DATE: 6/17/87 FLIGHT: 2/1R SUBSYSTEM: MECH/ETUD ABORT: 2/1R MDAC ID: 3131 UPLATCH MOTOR CLUTCH ITEM: FAILURE MODE: FAILS TO ENGAGE LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) ET UMBILICAL DOOR MECHANISM 3) UPLOCK LATCH MECHANISM UPLATCH MOTOR CLUTCH 5) 6) 7) 8) 9) CRITICALITIES HDW/FUNC HDW/FUNC ABORT FLIGHT PHASE RTLS: TAL: 2/1R PRELAUNCH: / 7 2/1R · LIFTOFF: AOA: ONORBIT: 2/1R DEORBIT: 2/1R ATO: LANDING/SAFING: / REDUNDANCY SCREENS: A [2] B [P] C [P] AFT FUSELAGE LOCATION: PART NUMBER: CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE, ACCELERATION, LOSS OF INPUT, VIBRATION EFFECTS/RATIONALE:

REFERENCES: JSC-11174

AT A REDUCED RATE.

FAILURE OF CLUTCH TO ENGAGE WOULD REDUCE POWER TRANSFER FOR

DRIVING UPLATCH MECHANISM. REDUNDANT MOTOR WOULD LATCH DOORS BUT

DATE: 6/17/87 SUBSYSTEM: MECH/ETUD MDAC ID: 3132	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: 3/3
ITEM: UPLATCH MOTOR CLUTCH FAILURE MODE: FAILS TO DISENGAGE	
LEAD ANALYST: J. BACHER SUBSY	S LEAD: H.J. LOWERY
BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) ET UMBILICAL DOOR MECHANISM 3) UPLOCK LATCH MECHANISM 4) UPLATCH MOTOR CLUTCH 5) 6) 7) 8)	
CRITTCAL	ITIES
FLIGHT PHASE HDW/FUNC PRELAUNCH: / LIFTOFF: / ONORBIT: / DEORBIT: 3/3 LANDING/SAFING: /	
REDUNDANCY SCREENS: A []	B [] C []
LOCATION: AFT FUSELAGE PART NUMBER:	
CAUSES: CONTAMINATION, MECHANICAL ACCELERATION, LOSS OF INPUT, VIBRAT	SHOCK, PIECE-PART FAILURE,
EFFECTS/RATIONALE: CLUTCH FAILING TO DISENGAGE WOULD R LATCHING WOULD BE COMPLETED. NO EF MISSION.	EDUCE REUNDANCY. UPLOCK FECT ON ORBITER/CREW OR
REFERENCES: JSC-11174	

DATE: 6/17/87 SUBSYSTEM: MECH/ETUD MDAC ID: 3133	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: 3/3
ITEM: UPLATCH MOTOR BRAKE FAILURE MODE: FAILS TO ENGAGE	
LEAD ANALYST: J. BACHER SUBSY	S LEAD: H.J. LOWERY
BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) ET UMBILICAL DOOR MECHANISM 3) UPLOCK LATCH MECHANISM 4) UPLATCH MOTOR BRAKE 5) 6) 7) 8)	
CRITICAL	LITIES
FLIGHT PHASE HDW/FUNC PRELAUNCH: / LIFTOFF: / ONORBIT: / DEORBIT: 3/3 LANDING/SAFING: /	ABORT HDW/FUNC RTLS: 3/3 TAL: 3/3 AOA: 3/3 ATO: /
REDUNDANCY SCREENS: A []	B[] C[]
LOCATION: AFT FUSELAGE PART NUMBER:	
CAUSES: CONTAMINATION, MECHANICAL ACCELERATION, LOSS OF INPUT, VIBRAT	SHOCK, PIECE-PART FAILURE,
EFFECTS/RATIONALE: FAILURE OF UPLATCH MOTOR BRAKE TO E SECOND MOTOR AND LATCH MECHANISMS W	
REFERENCES: JSC-11174	

HIGHEST CRITICALITY HDW/FUNC 6/17/87 DATE: FLIGHT: 2/1R SUBSYSTEM: MECH/ETUD 2/1R ABORT: MDAC ID: 3134

UPLATCH MOTOR BRAKE ITEM: FAILURE MODE: FAILS TO DISENGAGE

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- ET UMBILICAL DOOR MECHANISM 2)
- 3) UPLOCK LATCH MECHANISM
- 4) UPLATCH MOTOR BRAKE
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	./	RTLS:	2/1R
LIFTOFF:	/	TAL:	2/1R
ONORBIT:	./	AOA:	2/1R
DEORBIT:	2/1R	ATO:	1
LANDING/SAFING	: /		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: AFT FUSELAGE

PART NUMBER:

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE, ACCELERATION, LOSS OF INPUT, VIBRATION

EFFECTS/RATIONALE:

BRAKE FAILING TO DISENGAGE AT START OF UPLATCH MOTOR OPERATION WOULD RESULT IN SECOND MOTOR LATCHING THE DOOR AT A REDUCED RATE. FAILURE REDUCES REDUNDANCY.

HIGHEST CRITICALITY HDW/FUNC DATE: 6/17/87 1/1 MECH/ETUD FLIGHT: SUBSYSTEM: ABORT: 1/1 MDAC ID: 3135 TORQUE LIMIT CLUTCH/DIFFERENTIAL/GEAR ASSEMBLY ITEM: FAILURE MODE: PHYSICAL BINDING/JAMMING SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: J. BACHER BREAKDOWN HIERARCHY: MECHANICAL ACTUATION SYSTEM 1) ET UMBILICAL DOOR MECHANISM 2) UPLOCK LATCH MECHANISM TORQUE LIMIT CLUTCH/DIFFERENTIAL/GEAR ASSEMBLY 4) 5) 6) 7) 8) 9) CRITICALITIES HDW/FUNC HDW/FUNC ABORT FLIGHT PHASE PRELAUNCH: RTLS: 1/1 / TAL: 1/1 LIFTOFF: ONORBIT: AOA: 1/1 DEORBIT: 1/1 ATO: LANDING/SAFING: REDUNDANCY SCREENS: A [] B [] C[] LOCATION: AFT FUSELAGE PART NUMBER: CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE, ACCELERATION, VIBRATION EFFECTS/RATIONALE: BINDING/JAMMING WOULD PREVENT DOOR LATCHING. DOOR WOULD NOT BE SECURELY CLOSED ALLOWING IT TO OPEN OR NOT SEAL PROPERLY. ALLOWS HEAT TO ENTER UMBILICAL CAVITY DURING ENTRY. LOSS OF CREW/VEHICLE. REFERENCES: JSC-11174

DATE SUBS MDAC	E: 6/17/87 SYSTEM: MECH/ETUD C ID: 3136	HIGHEST CRITICALITY HDW/ FLIGHT: 1/ ABORT: 1/	
	TORQUE LIMIT CI LURE MODE: PARTIAL OUTPUT	UTCH/DIFFERENTIAL/GEAR ASSEMBLY	<u>r</u>
LEAD	O ANALYST: J. BACHER	SUBSYS LEAD: H.J. LOWERY	
1)	ET UMBILICAL DOOR MECHANIUPLOCK LATCH MECHANISM	SM	
		TICALITIES	
	FLIGHT PHASE HDW/FUNG PRELAUNCH: / LIFTOFF: / ONORBIT: / DEORBIT: 1/1 LANDING/SAFING: /	RTLS: 1/1	
REDU	UNDANCY SCREENS: A []	B [] C []	
	ATION: AFT FUSELAGE I NUMBER:		
	SES: CONTAMINATION, MECHAITIAL INPUT, VIBRATION	VICAL SHOCK, PIECE-PART FAILURE,	,
PART MOTO DOOR	ORS REACH STALL TIME LIMIT	POWER WOULD SLOW DOOR LATCHING. BEFORE DOOR LATCHED. IF UMBILITIES UMBILICAL CAVITY ON ENTRY.	
REFE	ERENCES: JSC-11174		

HIGHEST CRITICALITY HDW/FUNC DATE: 6/17/87 FLIGHT: 1/1 SUBSYSTEM: MECH/ETUD ABORT: 1/1 3137 MDAC ID: UPLATCH TORQUE TUBE ASSEMBLY TTEM: FAILURE MODE: PHYSICAL BINDING/JAMMING LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM ET UMBILICAL DOOR MECHANISM 2) 3) UPLOCK LATCH MECHANISM 4) UPLATCH TORQUE TUBE ASSEMBLY 5) 6) 7) 8) 9) CRITICALITIES HDW/FUNC ABORT RTLS: TAL: HDW/FUNC FLIGHT PHASE 1/1 PRELAUNCH: / / 1/1 LIFTOFF: 1/1 AOA: ONORBIT: DEORBIT: ATO: 1/1 LANDING/SAFING: / REDUNDANCY SCREENS: A [] B [] C [] LOCATION: AFT FUSELAGE PART NUMBER: V070-565130-001/V070-565130-002 CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE, ACCELERATION, VIBRATION EFFECTS/RATIONALE: BINDING/JAMMING OF TORQUE TUBE ASSEMBLY PREVENTS DOOR BEING LATCHED DUE TO OUTBOARD UPLOCK LATCH MECHANISMS BEING DRIVEN BY TORQUE TUBE ASSEMBLY. UMBILICAL DOOR NOT SECURELY LATCHED COULD OPEN OR NOT SEAL CLOSED ALLOWING HEAT TO ENTER UMBILICAL CAVITY.

HIGHEST CRITICALITY HDW/FUNC 6/17/87 DATE: 1/1 FLIGHT: SUBSYSTEM: MECH/ETUD 1/1 ABORT: MDAC ID: 3138 UPLATCH TORQUE TUBE ASSEMBLY ITEM: FAILURE MODE: TORQUE TUBE BROKEN LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: MECHANICAL ACTUATION SYSTEM ET UMBILICAL DOOR MECHANISM UPLOCK LATCH MECHANISM 3) UPLATCH TORQUE TUBE ASSEMBLY 4) 5) 6) 7) 8) 9) CRITICALITIES ABORT HDW/FUNC FLIGHT PHASE HDW/FUNC / 1/1 PRELAUNCH: RTLS: TAL: 1/1 LIFTOFF: AOA: 1/1 ONORBIT: ATO: 1/1 DEORBIT:

LANDING/SAFING:

PART NUMBER: V070-565130-001/V070-565130-002

AFT FUSELAGE

A []

CAUSES: MECHANICAL SHOCK, PIECE-PART FAILURE, ACCELERATION,

VIBRATION

LOCATION:

EFFECTS/RATIONALE:

REDUNDANCY SCREENS:

BROKEN TORQUE TUBE PREVENTS DOOR LATCHING BECAUSE INBOARD UPLATCH LOCK MECHANISM IS DRIVEN BY TORQUE TUBE ASSEMBLY. ON ENTRY HEAT COULD ENTER UMBILICAL CAVITY. LOSS OF CREW/VEHICLE.

B []

Cſ

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HIGHEST CRITICALITY HDW/FUNC DATE: 6/17/87 SUBSYSTEM: MECH/ETUD FLIGHT: 1/1 ABORT: 1/1 MDAC ID: 3139 ITEM: INBOARD UPLOCK LATCH LINKAGE FAILURE MODE: PHYSICAL BINDING/JAMMING LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) ET UMBILICAL DOOR MECHANISM 3) UPLOCK LATCH MECHANISM 4) INBOARD UPLOCK LATCH MECHANISM 5) 6) 7) 8) 9) CRITICALITIES HDW/FUNC HDW/FUNC ABORT FLIGHT PHASE RTLS: TAL: PRELAUNCH: 1/1 1/1 LIFTOFF: AOA: ONORBIT: 1/1 DEORBIT: 1/1 ATO: / LANDING/SAFING: REDUNDANCY SCREENS: A [] B [] C [] LOCATION: AFT FUSELAGE PART NUMBER: V070-565144-001/V070-565144-002 CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE, ACCELERATION, VIBRATION EFFECTS/RATIONALE: BINDING/JAMMING OF LINKAGE PREVENTS OPERATION OF INBOARD LATCH CAPTURE AND SECURING UMBILICAL DOORS IN THE CLOSED POSITION. UMBILICAL DOOR COULD OPEN ALLOWING HEAT TO ENTER DURING ENTRY. POSSIBLE LOSS OF CREW/VEHICLE.

DATE: 6/17/87 HIGHES SUBSYSTEM: MECH/ETUD MDAC ID: 3140 ITEM: INBOARD UPLOCK LATCH LINKAG FAILURE MODE: BROKEN/UNATTACHED	T CRITICALITY HDW/FUNC FLIGHT: 1/1 ABORT: 1/1
LEAD ANALYST: J. BACHER SUBSYS LEAD:	H.J. LOWERY
BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) ET UMBILICAL DOOR MECHANISM 3) UPLOCK LATCH MECHANISM 4) INBOARD UPLOCK LATCH MECHANISM 5) 6) 7) 8)	
CRITICALITIES FLIGHT PHASE HDW/FUNC ABOR	T HDW/FUNC
PRELAUNCH: / R LIFTOFF: / T ONORBIT: / A	TLS: 1/1 AL: 1/1 OA: 1/1
DEORBIT: 1/1 A LANDING/SAFING: /	TO: /
REDUNDANCY SCREENS: A [] B []	c []
LOCATION: AFT FUSELAGE PART NUMBER: V070-565144-001/V070-565144-	002
CAUSES: MECHANICAL SHOCK, PIECE-PART FAIL VIBRATION	URE, ACCELERATION,
EFFECTS/RATIONALE: BROKEN/UNATTACHED LINKAGE PREVENTS CAPTURE SECURE DOOR LATCH. UMBILICAL DOOR COULD O ENTER UMBILICAL CAVITY DURING ENTRY. POSS CREW/VEHICLE.	PEN AND ALLOW HEAT TO

SUBSY		6/17/87 MECH/ETUD 3141		HIGHEST	CRITICALITY FLIGHT: ABORT:	HDW/FUNG 1/1 1/1
			LATCH MECHANIS AL BINDING/JAM		e werten	
LEAD	ANALYSI	r: J. Bach	ER SUBSYS	E LEAD: F	H.J. LOWERY	
1) 2)	MECHANI ET UMBI	[LICAL DOO]	TION SYSTEM R MECHANISM HANISM			
			CRITICAL	TIES		
F	PRELA LIFTO ONORE DEORE	AUNCH:	HDW/FUNC / / 1/1 : /	RTI TAI AO	HDW/FUN Ls: 1/1 L: 1/1 A: 1/1 D: /	С
REDUN	DANCY S	SCREENS:	A [] I	3 []	c []	
PART	ION: NUMBER: 4-001 &		ELAGE 5102-001 & 002/	′V070-565	5103-001 & 00	2/V070-
		VTAMINATION V, VIBRATION	N, MECHANICAL S ON	вноск, р	ECE-PART FAI	LURE,
BINDI SECUR	E LATCH	MING PREVE H DOOR MAY	NTS CAPTURE OF OPEN ON ENTRY SSIBLE LOSS OF	ALLOWING	HEAT TO ENT	HOUT ER

	01(01101(0				
DATE: SUBSYSTEM: MDAC ID:	MECH/ETUD		HIGHEST	CRITICALITY FLIGHT: ABORT:	1/1
		LATCH MECH. /UNATTACHED	ANISM		
LEAD ANALYS	T: J. BACH	ER SU	BSYS LEAD: H	I.J. LOWERY	
	ICAL ACTUA	TION SYSTEM R MECHANISM HANISM			
		CRITT	CALITIES		
PREL LIFT ONOR DEOR	PHASE AUNCH: OFF: BIT: BIT: DING/SAFING	HDW/FUNC / / / 1/1	ABORT RTI TAI AOA	HDW/FUN Ls: 1/1 L: 1/1 A: 1/1 D: /	
REDUNDANCY	SCREENS:	A []	B []	c []	
LOCATION: PART NUMBER 565104-001	: V070-56	ELAGE 55102-001 &	002/V070-565	5103-001 & 00)2/V070-
CAUSES: ME	CHANICAL S	SHOCK, PIECE	-PART FAILU	RE, ACCELERAT	TION,
	TACHED LAT	CH MECHANIS		DOOR BEING LA ER UMBILICAL	
REFERENCES:	V070-565	500			

DATE: 6/17/87 HIGHEST CRITICALITY HDW/FUNC SUBSYSTEM: MECH/ETUD FLIGHT: 2/1R MDAC ID: 3143 ABORT: 2/1R

ITEM: READY TO LATCH LIMIT SWITCH FAILURE MODE: PREMATURE OPERATION

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
 2) ET UMBILICAL DOOR MECHANISM
- 3) UPLOCK LATCH MECHANISM
- 4) READY TO LATCH LIMIT SWITCH

5) 6)

7)

8) 9)

CRITICALITIES

HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE / PRELAUNCH: RTLS: 2/1R LIFTOFF: / TAL: 2/1R AOA: 2/1R ONORBIT: 2/1R ATO: DEORBIT: LANDING/SAFING:

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:

AFT FUSELAGE

PART NUMBER:

CAUSES: CONTAMINATION, ERRONEOUS INPUT, MECHANICAL SHOCK, PIECE-PART FAILURE, VIBRATION, INADVERTENT OPERATION

EFFECTS/RATIONALE:

PREMATURE INDICATION OF READY TO LATCH WOULD CAUSE MOTOR TO STOP. REDUNDANT MOTOR WOULD CONTINUE TO CAPTURE ROLLER BUT AT A REDUCED RATE. EFFECT IS A LOSS OF REDUNDANCY. NO EFFECT ON CREW/VEHICLE OR MISSION.

HIGHEST CRITICALITY HDW/FUNC DATE: 6/17/87 FLIGHT: 3/3 SUBSYSTEM: MECH/ETUD 3/3 ABORT: MDAC ID: 3144 READY TO LATCH LIMIT SWITCH ITEM: FAILURE MODE: FAILS TO SWITCH LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM ET UMBILICAL DOOR MECHANISM 2) UPLOCK LATCH MECHANISM 3) READY TO LATCH LIMIT SWITCH 4) 5) 6) 7) 8) 9) CRITICALITIES HDW/FUNC FLIGHT PHASE HDW/FUNC ABORT 3/3 PRELAUNCH: RTLS: TAL: 3/3 / LIFTOFF: AOA: 3/3 ONORBIT: ATO: DEORBIT: LANDING/SAFING: C [REDUNDANCY SCREENS: A [] AFT FUSELAGE LOCATION: PART NUMBER: CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE, LOSS OF INPUT, VIBRATION EFFECTS/RATIONALE: FAILURE TO INDICATE READY TO LATCH CAUSES CONTINUED MOTOR OPERATION. LATCH MECHANISM WILL CONTACT A STOP AND STALL MOTOR. NO EFFECT ON CREW/VEHICLE OR MISSION.

DATE: 8/18/87 HIGHEST CRITICALITY HDW/FUNC SUBSYSTEM: MECH/ETUD/EPD&C FLIGHT: 2/1R

ABORT: 2/1R MDAC ID: 3501

RELAY ITEM:

FAILURE MODE: FAILS TO CLOSE

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) ET UMBILICAL DOOR EPD&C
- 3) MOTOR CONTROL ASSEMBLY
- 4) RELAY
- 5)
- 6)
- 7)
- 8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	,	RTLS:	2/1R
LIFTOFF:	./	TAL:	2/1R
ONORBIT:	,	AOA:	2/1R
DEORBIT:	2/1R	ATO:	/
LANDING/SAFIN	NG: /		•

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: AFT FUSELAGE, AVIONICS BAYS 4, 5, 6

PART NUMBER: K7-K10, K12-K18, K57, K59

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE, VIBRATION

EFFECTS/RATIONALE:

RELAY IS USED TO STOW THE CENTERLINE LATCHES, CLOSING THE UMBILICAL DOORS, OR ENGAGING THE UPLOCK LATCHES. FAILURE OF RELAY CAUSES AN OPEN CIRCUIT AND THE LOSS OF AC POWER TO A MOTOR. THE REDUNDANT MOTOR CONTINUES THE PARTICUALR FUNCTION BUT AT A REDUCED RATE. NO EFFECT ON CREW/VEHICLE OR MISSION.

HIGHEST CRITICALITY HDW/FUNC 8/18/87 FLIGHT: 3/3 SUBSYSTEM: MECH/ETUD/EPD&C 3/3 ABORT: 3502 MDAC ID: RELAY ITEM: FAILURE MODE: FAILS TO OPEN LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM ET UMBILICAL DOOR EPD&C 2) 3) MOTOR CONTROL ASSEMBLY RELAY 4) 5) 6) 7) 8) 9) CRITICALITIES HDW/FUNC FLIGHT PHASE HDW/FUNC ABORT RTLS: 3/3 PRELAUNCH: TAL: 3/3 / LIFTOFF: ONORBIT: AOA: 3/3 3/3 ATO: DEORBIT: LANDING/SAFING: B[] C[] REDUNDANCY SCREENS: A [] AFT FUSELAGE, AVIONICS BAYS 4, 5, 6 LOCATION: PART NUMBER: K7-K10, K12-K18, K57, K59 CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE, VIBRATION EFFECTS/RATIONALE: FAILURE OF RELAY TO OPEN HAS NO EFFECT ON CREW/VEHICLE OR MISSION. POWER CAN BE REMOVED FROM A MOTOR WHEN SECOND RELAY OPENS FOR CENTERLINE LATCH STOWING AND UPLOCK LATCH ENGAGEMENT. DOOR CLOSURE RELAY DOES NOT HAVE REDUNDANCY BUT POWER CAN BE REMOVED BY FLIGHT DECK SWITCHES.

8/18/87 HIGHEST CRITICALITY HDW/FUNC SUBSYSTEM: MECH/ETUD/EPD&C FIJCHT.

ITEM:

RELAY

FAILURE MODE: FAILS TO CLOSE

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- ET UMBILICAL DOOR EPD&C 2)
- MOTOR CONTROL ASSEMBLY 3)
- RELAY 4)
- 5)
- 6)
- 7) 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	2/1R
LIFTOFF:	/	TAL:	2/1R
ONORBIT:	/	AOA:	2/1R
DEORBIT:		ATO:	/
LANDING/SAFING:	2/1R		

REDUNDANCY SCREENS: A [2] B [F] C [P]

AFT FUSELAGE, AVIONICS BAYS 4, 5, 6 LOCATION:

PART NUMBER: K5, K6, K10-K12, K14, K15, K17-K20, K56, K58

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE,

VIBRATION

EFFECTS/RATIONALE:

RELAY IS USED TO LOCK THE CENTERLINE LATCHES, OPENING THE UMBILICAL DOORS, OR RELEASE THE UPLOCK LATCHES. THE ET UMBILICAL DOORS MUST BE OPENED ASAP POSTLANDING WHEN A TAL OR RTLS OCCURS AND FOR ALL OTHER CASES IF THERE IS AN INDICATION OF H2 BUILDUP. RELAY FAILURE REDUCES REDUNDANCY. SECOND MOTOR WOULD CONTINUE THE FUNCTION BUT AT A SLOWER RATE. NO EFFECT ON CREW/VEHICLE.

HDW/FUNC HIGHEST CRITICALITY 8/18/87 FLIGHT: 3/3 SUBSYSTEM: MECH/ETUD/EPD&C 3/3 ABORT: MDAC ID: 3504 RELAY ITEM: FAILURE MODE: FAILS TO OPEN SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: J. BACHER BREAKDOWN HIERARCHY: MECHANICAL ACTUATION SYSTEM 1) ET UMBILICAL DOOR EPD&C 2) 3) MOTOR CONTROL ASSEMBLY RELAY 4) 5) 6) 7) 8) 9) CRITICALITIES HDW/FUNC HDW/FUNC ABORT FLIGHT PHASE PRELAUNCH: RTLS: 3/3 TAL: 3/3 LIFTOFF: 3/3 AOA: ONORBIT: ATO: DEORBIT: LANDING/SAFING: B[] C[] REDUNDANCY SCREENS: A [1 AFT FUSELAGE, AVIONICS BAYS 4, 5, 6 LOCATION: PART NUMBER: K5, K6, K10-K12, K14, K15, K17-K20, K56, K58 CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE, **VIBRATION** EFFECTS/RATIONALE: RELAY IS USED TO LOCK THE CENTERLINE LATCHES, OPENING THE ET UMBILICAL DOORS, OR RELEASE THE UPLOCK LATCHES. FAILURE OF RELAY

TO OPEN HAS NO EFFECT ON CREW/VEHICLE. POWER CAN BE REMOVED BY

REFERENCES: VS70-560109, VS72-956099

OTHER MEANS POSTLANDING.

DATE: 8/18/87 HIGHEST CRITICALITY HDW/FUNC SUBSYSTEM: MECH/ETUD/EPD&C FLIGHT: 3/3

MDAC ID: 3505 ABORT: 3/3

ITEM: ET UMBILICAL DOOR MODE SWITCH

FAILURE MODE: FAILS TO SWITCH FROM GPC TO MANUAL MODE

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) ET UMBILICAL DOOR EPD&C
- 3) DISPLAY AND CONTROL
- 4) ET UMBILICAL DOOR MODE SWITCH

5) 6)

7)

8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	. HDW/FUNC
PRELAUNCH:	,	RTLS:	3/3
LIFTOFF:	,	TAL:	3/3
ONORBIT:	,	AOA:	3/3
DEORBIT:	3/3	ATO:	/
LANDING/SAFING	; : /		. •

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: ORBITER COCKPIT PANEL R2

PART NUMBER: S47

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE, VIBRATION

EFFECTS/RATIONALE:

FAILURE OF ET UMBILICAL DOOR MODE SWITCH TO MOVE FROM GPC TO MANUAL MODE HAS NO EFFECT ON CREW/VEHICLE OR MISSION. SWITCH FAILING IN THE GPC MODE WILL NOT PREVENT ET UMBILICAL DOOR CLOSURE. THE NECESSARY COMMANDS CAN BE SENT TO THE ORBITER FROM MCC. SWITCH IS IN GPC MODE ON ASCENT TO ALLOW GNC SOFTWARE TO CLOSE THE DOORS DURING AN RTLS. THIS MODE IS ALSO USED FOR REALTIME UP-LINK COMMANDS TO CLOSE ET UMBILICAL DOORS, IS REDUNDANT CLOSURE PROCEDURE.

HDW/FUNC HIGHEST CRITICALITY 8/18/87 DATE: FLIGHT: 3/3 SUBSYSTEM: MECH/ETUD/EPD&C 3/3 ABORT: 3506 MDAC ID: ET UMBILICAL DOOR MODE SWITCH ITEM: FAILURE MODE: FAILS TO SWITCH FROM MANUAL TO GPC MODE LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM ET UMBILICAL DOOR EPD&C 2) 3) DISPLAY AND CONTROL ET UMBILICAL DOOR MODE SWITCH 5) 6) 7) 8) 9)

 PRELAUNCH:
 /
 RTLS:
 3/3

 LIFTOFF:
 /
 TAL:
 3/3

 ONORBIT:
 /
 AOA:
 3/3

 DEORBIT:
 3/3
 ATO:
 /

CRITICALITIES

HDW/FUNC ABORT

HDW/FUNC

LANDING/SAFING: /

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: ORBITER COCKPIT PANEL R2

PART NUMBER: S47

FLIGHT PHASE

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE, VIBRATION

EFFECTS/RATIONALE:

FAILURE OF ET UMBILICAL DOOR MODE SWITCH TO MOVE FROM MANUAL TO GPC MODE HAS NO EFFECT ON CREW/VEHICLE OR MISSION. SWITCH FAILING IN THE MANUAL MODE KEEPS SUPPLYING RELAY LOGIC POWER FROM THE FOUR CONTROL BUSES. THIS POWER CAN BE TAKEN OFF LINE BY SWITCHING OFF THREE MCA LOGIC SWITCHES (SWITCHES S4, S10, S14 ON PANEL MA73CB). IF POWER IS LEFT ON-LINE, MANUAL OPERATION OF UMBILICAL DOORS AND UPLOCK LATCHES IS POSSIBLE.

DATE: 8/18/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: MECH/ETUD/EPD&C FLIGHT: 2/1R

MDAC ID: 3507 ABORT: 2/1R

ITEM: CENTELRINE LATCH-STOW SWITCH

FAILURE MODE: FAILS TO SWITCH FROM GND TO STOW

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
 - ET UMBILICAL DOOR EPD&C
- 3) DISPLAY AND CONTROL
- 4) CENTERLINE LATCH-STOW SWITCH

5)

6) 7)

8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	,	RTLS:	3/3
LIFTOFF:	,	TAL:	2/1R
ONORBIT:	,	AOA:	2/1R
DEORBIT:	2/1R	ATO:	./
LANDING/SAFI	NG: /		•

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: ORBITER COCKPIT PANEL R2

PART NUMBER: S48

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE,

VIBRATION

EFFECTS/RATIONALE:

FAILURE OF SWITCH TO GO FROM GND TO STOW PREVENTS THE FOUR CONTROL BUSES FROM SUPPLYING RELAY LOGIC POWER TO THE AFT MOTOR CONTROLLERS. THIS PREVENTS MANUAL CENTELRINE LATCH STOWING. NO EFFECT ON CREW/VEHICLE OR MISION BECAUSE OF ALTERNATIVE GPC MODE OF DOOR CLOSURE.

HIGHEST CRITICALITY HDW/FUNC DATE: 8/18/87 3/3 SUBSYSTEM: MECH/ETUD/EPD&C FLIGHT: 3/3 ABORT: MDAC ID: 3508 CENTELRINE LATCH-STOW SWITCH ITEM: FAILURE MODE: FAILS TO SWITCH FROM STOW TO GND LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM ET UMBILICAL DOOR EPD&C 2) DISPLAY AND CONTROL 3) CENTERLINE LATCH-STOW SWITCH 4) 5) 6) 7) 8) 9) CRITICALITIES

HDW/FUNC HDW/FUNC ABORT FLIGHT PHASE RTLS: 3/3 PRELAUNCH: TAL: 3/3 LIFTOFF: / AOA: 3/3 ONORBIT: ATO: DEORBIT:

LANDING/SAFING: /

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: ORBITER COCKPIT PANEL R2

PART NUMBER: S48

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE, VIBRATION

EFFECTS/RATIONALE:

FAILURE OF SWITCH TO GO FROM STOW TO GND HAS NO EFFECT ON CREW/VEHICLE OR MISSION. SWITCH ENABLES OPERATION OF THE TWO CENTERLINE LATCHES ACTUATORS. WHEN ET UMBILICAL DOOR MODE SWITCH (\$47) IS IN GPC MODE THIS WILL DISABLE THE CENTERLINE LATCH-STOW SWITCH.

HIGHEST CRITICALITY HDW/FUNC 8/18/87 DATE:

SUBSYSTEM: MECH/ETUD/EPD&C FLIGHT: 2/1R 2/1R MDAC ID: 3509 ABORT:

ET UMBILICAL DOOR OPEN-CLOSE SWITCH ITEM: FAILURE MODE: FAILS TO SWITCH FROM OFF TO CLOSE

SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: J. BACHER

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) ET UMBILICAL DOOR EPD&C
- DISPLAY AND CONTROL
- ET UMBILICAL DOOR OPEN-CLOSE SWITCH 4)

5)

6) 7)

8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/3
LIFTOFF:	/	TAL:	2/1R
ONORBIT:	/	AOA: .	2/1R
DEORBIT:	2/1R	ATO:	/
LANDING/SAFIN	1G: /	•	,

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: ORBITER COCKPIT PANEL R2 PART NUMBER: S49 (LEFT), S51 (RIGHT)

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE, VIBRATION

EFFECTS/RATIONALE:

FAILURE OF SWITCH TO GO FROM OFF TO CLOSE PREVENTS THE FOUR CONTROL BUSES FROM SUPPLYING RELAY LOGIC POWER. THIS PREVENTS MANUAL CLOSING OF THE LEFT AND RIGHT ET UMBILICAL DOORS. NO EFFECT ON CREW/VEHICLE OR MISSION BECAUSE OF ALTERNATIVE GPC MODE OF DOOR CLOSURE.

HIGHEST CRITICALITY HDW/FUNC 8/18/87 DATE: FLIGHT: 3/3 SUBSYSTEM: MECH/ETUD/EPD&C 3/3 ABORT: 3510 MDAC ID: ET UMBILICAL DOOR OPEN-CLOSE SWITCH ITEM: FAILURE MODE: FAILS TO SWITCH FROM CLOSE TO OFF LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: MECHANICAL ACTUATION SYSTEM 1) ET UMBILICAL DOOR EPD&C 2) 3) DISPLAY AND CONTROL ET UMBILICAL DOOR OPEN-CLOSE SWITCH 4) 5) 6) 7) 8) 9) CRITICALITIES

	O2/2 2 2 01.		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/3
LIFTOFF:	/	TAL:	3/3
ONORBIT:	7	AOA:	3/3
DEORBIT:	3/3	ATO:	/
LANDING/SAFING	: /		

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: ORBITER COCKPIT PANEL R2 PART NUMBER: S49 (LEFT), S51 (RIGHT)

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE, VIBRATION

EFFECTS/RATIONALE:

FAILURE OF SWITCH TO GO FROM CLOSE TO OFF HAS NO EFFECT ON CREW/VEHICLE OR MISSION. OFF SWITCH POSITION REMOVES RELAY LOGIC POWER FOR MANUAL DOOR OPERATION. WHEN ET UMBILICAL DOOR MODE SWITCH (\$47) IS IN GPC MODE THIS WILL DISABLE LEFT/RIGHT ET UMBILICAL DOOR OPEN-CLOSE SWITCH.

HIGHEST CRITICALITY HDW/FUNC DATE: 8/18/87 SUBSYSTEM: MECH/ETUD/EPD&C FLIGHT: 2/1R

ABORT: 2/1R MDAC ID: 3511

ET UMBILICAL DOOR OPEN-CLOSE SWITCH ITEM: FAILURE MODE: FAILS TO SWITCH FROM OFF TO OPEN

SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: J. BACHER

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- ET UMBILICAL DOOR EPD&C 2)
- DISPLAY AND CONTROL
- ET UMBILICAL DOOR OPEN-CLOSE SWITCH

5) 6)

7)

8) 9)

CRITICALITIES

HDW/FUNC ABORT FLIGHT PHASE HDW/FUNC RTLS: 2/1R PRELAUNCH: TAL: 2/1R LIFTOFF: / ONORBIT: AOA: 2/1R DEORBIT: ATO: / LANDING/SAFING: 2/1R

A [2] B [P] C [P] REDUNDANCY SCREENS:

ORBITER COCKPIT PANEL R2 LOCATION: PART NUMBER: S49 (LEFT), S51 (RIGHT)

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE,

VIBRATION

EFFECTS/RATIONALE:

THE ET UMBILICAL DOORS MUST BE OPENED ASAP POSTLANDING WHEN A TAL OR RTLS OCCURS AND FOR ANY OTHER CASE IF THER IS AN INDICATION OF H2 BUILDUP. POSSIBLE LOSS OR DAMAGE TO ORBITER MAY OCCUR IF UNABLE TO OPEN UMBILICAL DOOR TO RELEASE THE H2.

HDW/FUNC HIGHEST CRITICALITY 8/18/87 DATE: FLIGHT: 2/1R SUBSYSTEM: MECH/ETUD/EPD&C 2/1R ABORT: 3512 MDAC ID:

ET UMBILICAL DOOR LATCH-RELEASE SWITCH ITEM:

FAILURE MODE: FAILS TO SWITCH FROM OFF TO LATCH

SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: J. BACHER

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- ET UMBILICAL DOOR EPD&C 2)
- DISPLAY AND CONTROL 3)
- ET UMBILICAL DOOR LATCH-RELEASE SWITCH 4)

5)

6)

7)

8)

9)

CRITICALITIES

V1/2 2 2 V1.22 2		
HDW/FUNC	ABORT	HDW/FUNC
,	RTLS:	3/3
,	TAL:	2/1R
. /	AOA:	2/1R
2/1R	ATO:	/
NG: /		
	. /	/ RTLS: / TAL: / AOA: 2/1R ATO:

REDUNDANCY SCREENS: A [2] B [P] C [P]

ORBITER COCKPIT PANEL R2 LOCATION: PART NUMBER: S50 (LEFT), S52 (RIGHT)

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE, VIBRATION

EFFECTS/RATIONALE:

FAILURE OF SWITCH TO GO FROM OFF TO LATCH PREVENTS THE FOUR CONTROL BUSES FROM SUPPLYING RELAY LOGIC POWER. THIS PREVENTS MANUAL LATCHING OF THE LEFT AND RIGHT ET UMBILICAL DOORS. NO EFFECT ON CREW/VEHICLE OR MISSION BECAUSE OF ALTERNATIVE GPC MODE OF DOOR CLOSURE.

HIGHEST CRITICALITY HDW/FUNC 8/18/87 DATE: 3/3 SUBSYSTEM: MECH/ETUD/EPD&C FLIGHT: ABORT: 3/3 MDAC ID: 3513 ET UMBILICAL DOOR LATCH-RELEASE SWITCH ITEM: FAILURE MODE: FAILS TO SWITCH FROM LATCH TO OFF LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: MECHANICAL ACTUATION SYSTEM 1) ET UMBILICAL DOOR EPD&C 2) DISPLAY AND CONTROL 3) ET UMBILICAL DOOR LATCH-RELEASE SWITCH 4) 5) 6) 7) 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE RTLS: 3/3 PRELAUNCH: 3/3 LIFTOFF: TAL: AOA: 3/3 ONORBIT: 3/3 ATO: DEORBIT: LANDING/SAFING: B[] C[] REDUNDANCY SCREENS: Αſ 1 ORBITER COCKPIT PANEL R2 LOCATION: PART NUMBER: S50 (LEFT), S52 (RIGHT) CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE, VIBRATION EFFECTS/RATIONALE: FAILURE OF SWITCH TO GO FROM LATCH TO OFF HAS NO EFFECT ON CREW/VEHICLE OR MISSION. OFF SWITCH POSITION REMOVES RELAY LOGIC POWER FOR MANUAL DOOR OPERATION. WHEN ET UMBILICAL DOOR MODE SWITCH (S47) IS IN GPC MODE THIS WILL DISABLE ET UMBILICAL DOOR LATCH-RELEASE SWITCH.

HIGHEST CRITICALITY HDW/FUNC 8/18/87 DATE:

FLIGHT: 2/1R SUBSYSTEM: MECH/ETUD/EPD&C 2/1R ABORT: MDAC ID: 3514

ET UMBILICAL DOOR LATCH-RELEASE SWITCH ITEM: FAILURE MODE: FAILS TO SWITCH FROM OFF TO RELEASE

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- ET UMBILICAL DOOR EPD&C
- 3) DISPLAY AND CONTROL
- ET UMBILICAL DOOR LATCH-RELEASE SWITCH 4)

5)

6)

7)

8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	,	RTLS:	2/1R
LIFTOFF:	,	· TAL:	2/1R
ONORBIT:	,	AOA:	2/1R
DEORBIT:	./	ATO:	/
LANDING/SAFING:	2/1R		•

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: ORBITER COCKPIT PANEL R2 PART NUMBER: S50 (LEFT), S52 (RIGHT)

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE, VIBRATION

EFFECTS/RATIONALE:

THE ET UMBILICAL DOORS MUST BE OPENED ASAP POSTLANDING WHEN A TAL OR RTLS OCCURS AND FOR ANY OTHER CASE IF THERE IS AN INDICATION OF H2 BUILDUP. POSSIBLE LOSS OR DAMAGE TO ORBITER MAY OCCUR IF UNABLE TO UNLATCH AND OPEN UMBILICAL DOOR TO RELEASE THE H2.

HIGHEST CRITICALITY HDW/FUNC 8/18/87 DATE: FLIGHT: 2/1R SUBSYSTEM: MECH/ETUD/EPD&C ABORT: 2/1R 3515 MDAC ID:

CONTROL BUS FUSE ITEM:

FAILURE MODE: FAILS OUT OF TOLERANCE, OPEN (ELECTRICAL)

SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: J. BACHER

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- ET UMBILICAL DOOR EPD&C 2)
- 3) DISPLAY AND CONTROL
- CONTROL BUS FUSE 4)
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	./	RTLS:	2/1R
LIFTOFF:	<i>'</i> / ·	TAL:	2/1R
ONORBIT:		AOA:	2/1R
DEORBIT:	2/1R	ATO:	/
LANDING/SAFING	: 2/1R		•

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: ORBITER COCKPIT PANEL R2

PART NUMBER: F36, F37, F38, F39

CAUSES: CONTAMINATION, OVERLOAD, PIECE-PART FAILURE, VIBRATION, MECHANICAL SHOCK

EFFECTS/RATIONALE:

BLOWN FUSE REDUCES REDUNDANCY. REDUNDANT CONTROL BUSES WOULD STILL BE ABLE TO SUPPLY NEEDED POWER FOR CENTERLINE LATCH, DOOR MOVEMENT AND UPLOCK LATCH FUNCTIONS. NO EFFECT ON CREW/VEHICLE OR MISSION.

HIGHEST CRITICALITY HDW/FUNC 8/18/87 DATE:

FLIGHT: 2/1R SUBSYSTEM: MECH/ETUD/EPD&C 2/1R ABORT: MDAC ID: 3516

MCA AC POWER CIRCUIT BREAKER ITEM:

FAILURE MODE: FAILS OUT OF TOLERANCE, OPEN (ELECTRICAL)

SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: J. BACHER

BREAKDOWN HIERARCHY:

- MECHANICAL ACTUATION SYSTEM
- ET UMBILICAL DOOR EPD&C 2)
- DISPLAY AND CONTROL 3)
- AC BUS 4)
- MCA AC POWER CIRCUIT BREAKER 5)

6) 7)

8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	,	RTLS:	2/1R
LIFTOFF:	,	TAL:	2/1R
ONORBIT:	/	AOA:	2/1R
DEORBIT:	2/1R	ATO:	1
LANDING/SAFING:	2/1R		

REDUNDANCY SCREENS: A [2] B [P] C [P]

PANEL MA73CD LOCATION: PART NUMBER: CB4, CB10, CB14

CAUSES: OVERLOAD, PIECE-PART FAILURE, INADVERTENT OPERATION

EFFECTS/RATIONALE:

FAILURE OF CIRCUIT BREAKER CAUSES LOSS OF THE THREE PHASE AC POWER FROM THE MAIN AC BUS. THIS CAUSES THE LOSS OF 4 MOTORS. REDUNDANT MOTORS WILL COMPLETE FUNCTION BUT AT A REDUCED RATE. NO EFFECT ON CREW/VEHICLE OR MISSION.

HIGHEST CRITICALITY HDW/FUNC 8/18/87

SUBSYSTEM: MECH/ETUD/EPD&C FLIGHT: 2/1R 2/1R ABORT: MDAC ID: 3517

MCA RELAY LOGIC POWER SWITCH ITEM:

FAILURE MODE: FAILS OFF

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- MECHANICAL ACTUATION SYSTEM 1)
- ET UMBILICAL DOOR EPD&C 2)
- DISPLAY AND CONTROL 3)
- CONTROL BUS 4)
- MCA RELAY LOGIC POWER SWITCH 5)

6) 7)

8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	2/1R
LIFTOFF:	/	TAL:	2/1R
ONORBIT:	. /	AOA:	2/1R
DEORBIT:	2/1R	ATO:	/
LANDING/SAFING:	2/1R		•

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PANEL MA73CB PART NUMBER: S4, S10, S14

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE,

VIBRATION

EFFECTS/RATIONALE:

SWITCH FAILING IN THE OFF POSITION CAUSES THE LOSS OF CONTROL SIGNAL TO THE ASSOCIATED RPC. SECOND RPC ALLOWS CONTINUED OPERATION FOR A FUNCTION BUT AT A REDUCED RATE. NO EFFECT ON CREW/VEHICLE OR MISSION.

HIGHEST CRITICALITY HDW/FUNC 8/18/87 DATE: FLIGHT: 3/3 SUBSYSTEM: MECH/ETUD/EPD&C 3/3 ABORT: MDAC ID: 3518 MCA RELAY LOGIC POWER SWITCH ITEM: FAILURE MODE: FAILS ON LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) ET UMBILICAL DOOR EPD&C 3) DISPLAY AND CONTROL CONTROL BUS 4) 5) MCA RELAY LOGIC POWER SWITCH 6) 7) 8) 9)

CRITICALITIES

	Q2/4 2 2 Q1		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	3/3
LIFTOFF:	,	TAL:	3/3
ONORBIT:	<i>'</i> /	AOA:	3/3
DEORBIT:	3/3	ATO:	/
LANDING/SAFING	: 3/3		

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: PANEL MA73CB PART NUMBER: S4, S10, S14

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE, VIBRATION

EFFECTS/RATIONALE:

SWITCH FAILING IN THE ON POSITION HAS NO EFFECT ON CREW/VEHICLE OR MISSION. THE USE OF OTHER COCKPIT SWITCHES AND CIRCUIT BREAKERS WILL PREVENT INADVERTENT ET UMBILICAL DOOR OPERATION.

8/18/87 HIGHEST CRITICALITY HDW/FUNC DATE:

SUBSYSTEM: MECH/ETUD/EPD&C FLIGHT: 2/1R ABORT: 2/1R MDAC ID: 3519

REMOTE POWER CONTROLLER ITEM:

FAILURE MODE: FAILS OFF

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- ET UMBILICAL DOOR EPD&C 2)
- DISPLAY AND CONTROL 3)
- CONTROL BUS 4)
- MCA RELAY LOGIC POWER SWITCH 5)
- REMOTE POWER CONTROLLER 6)
- 7)
- 8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	1	RTLS:	2/1R
LIFTOFF:	/	TAL:	2/1R
ONORBIT:	/	AOA:	2/1R
DEORBIT:	2/1R	ATO:	/
LANDING/SAFING:	2/1R		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: PART NUMBER:

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE, VIBRATION

EFFECTS/RATIONALE:

LOSS OF A REMOTE POWER CONTROLLER CAUSES A LOSS OF REDUNDANCY. SECOND RPC CONTINUES OPERATING REDUNDANT MOTORS. NO EFFECT ON CREW/VEHICLE OR MISSION.

HIGHEST CRITICALITY HDW/FUNC 8/18/87 DATE: FLIGHT: 3/3 SUBSYSTEM: MECH/ETUD/EPD&C 3/3 ABORT: MDAC ID: 3520 HYBRID CIRCUIT DRIVER ITEM: FAILURE MODE: FAILS OFF SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: J. BACHER BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) ET UMBILICAL DOOR EPD&C 3) DISPLAY AND CONTROL HYBRID CIRCUIT DRIVER 4) 5) 6) 7) 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE / RTLS: 3/3 PRELAUNCH: TAL: 3/3 LIFTOFF: AOA: 3/3 ONORBIT: ATO: 3/3 DEORBIT:

REDUNDANCY SCREENS: A [] B [] C [

LOCATION: AFT AVIONICS BAY 4, AFT AVIONICS BAY 5
PART NUMBER: AR3, AR6, AR3-AR5, AR4, AR5, AR21

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE, TEMPERATURE, VIBRATION

EFFECTS/RATIONALE:

HYBRID CIRCUIT DRIVER FAILING OFF HAS NO EFFECT ON CREW/VEHICLE OR MISSION. DEVICE IS USED TO DRIVE FLIGHT DECK TALKBACK INDICATORS. LOSS OF ONE DEVICE REDUCES REDUNDANCY, SECOND DEVICE WILL DRIVE TALKBACK. STATUS OF CENTERLINE LATCHES AND READY-TO-LATCH SWITCHES IS ALSO AVAILABLE FROM TELEMETRY AND GPC TM.

REFERENCES: VS70-560109, VS72-956099

LANDING/SAFING: 3/3

HIGHEST CRITICALITY HDW/FUNC DATE: 8/18/87 SUBSYSTEM: MECH/ETUD/EPD&C FLIGHT: 3/3 3521 ABORT: 3/3 MDAC ID: ITEM: HYBRID CIRCUIT DRIVER FAILURE MODE: FAILS ON LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) ET UMBILICAL DOOR EPD&C 3) DISPLAY AND CONTROL 4) HYBRID CIRCUIT DRIVER 5) 6) 7) 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE RTLS: TAL: AOA: ATO: / PRELAUNCH: 3/3 3/3 LIFTOFF: 1 ONORBIT: 3/3 DEORBIT: 3/3 LANDING/SAFING: 3/3 REDUNDANCY SCREENS: A [] B [] C [] LOCATION: AFT AVIONICS BAY 4, AFT AVIONICS BAY 5 PART NUMBER: AR3, AR6, AR3-AR5, AR4, AR5, AR21 CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE, TEMPERATURE, VIBRATION EFFECTS/RATIONALE: HYBRID CIRCUIT DRIVER FAILING ON HAS NO EFFECT ON CREW/VEHICLE OR MISSION. IF FAILURE OCCURS BEFORE DUAL MOTOR OPERATION TIME HAS ELAPSED A PREMATURE TALKBACK INDICATION WOULD OCCUR. SINCE TELEMETRY AND GPC TM WOULD NOT CONFIRM FUNCTION HAD BEEN COMPLETED CREW CAN CONTINUE UMBILICAL DOOR CLOSURE.

HDW/FUNC HIGHEST CRITICALITY 8/18/87 DATE: FLIGHT: SUBSYSTEM: MECH/ETUD/EPD&C 2/1R ABORT: 2/1R MDAC ID: 3522

ITEM:

DIODE

FAILURE MODE: OPEN CIRCUIT

SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: J. BACHER

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- ET UMBILICAL DOOR EPD&C 2)
- AFT MOTOR CONTROL ASSEMBLY 3)
- 4) DIODE
- 5)
- 6)
- 7)
- 8) 9)

CRITICALITIES

FLIGHT PHASE H	IDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	./	RTLS:	2/1R
LIFTOFF:	<i>'</i> /	TAL:	2/1R
ONORBIT:	. /	AOA:	2/1R
DEORBIT:	2/1R	ATO:	/
IANDING/SAFING:	2/1R		•

LANDING/SAFING: 2/IR

REDUNDANCY SCREENS: A [1] B [F] C [P]

LOCATION:

AFT AVIONICS BAYS 4, 5, 6

PART NUMBER: SEE REFERENCES

CAUSES: THERMAL STRESS, VIBRATION, CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE

EFFECTS/RATIONALE:

OPEN CIRCUIT FAILURE MODE CAUSES A LOSS OF INPUT TO LOGIC GATES. LOSS OF A LOGIC GATE CAUSES A LOSS OF AN ACTUATING MOTOR. REDUNDANT DIODE WILL ALLOW CONTINUED ACTUATOR MOTOR OPERATION, FUNCTION WILL BE COMPLETED BUT A REDUCED RATE. NO EFFECT ON CREW/VEHICLE OR MISSION.

HIGHEST CRITICALITY HDW/FUNC DATE: 8/18/87 3/3 SUBSYSTEM: MECH/ETUD/EPD&C FLIGHT: MDAC ID: 3523 ABORT: 3/3 DIODE ITEM: FAILURE MODE: SHORTED OUT LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM ET UMBILICAL DOOR EPD&C 2) AFT MOTOR CONTROL ASSEMBLY 3) DIODE . 4) 5) 6) 7) 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE RTLS: 3/3 PRELAUNCH: 3/3 TAL: LIFTOFF: 3/3 AOA: ONORBIT: 3/3 ATO: DEORBIT: / LANDING/SAFING: 3/3 REDUNDANCY SCREENS: A [] B [] C [] LOCATION: AFT AVIONICS BAYS 4, 5, 6 PART NUMBER: SEE REFERENCES CAUSES: THERMAL STRESS, VIBRATION, CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE EFFECTS/RATIONALE: SHORTED OUT DIODE HAS NO EFFECT ON CREW/VEHICLE OR MISSION. MANUAL MODE FOR CLOSING AND LATCHING THE ET UMBILICAL DOORS A SHORTED DIODE WOULD ALLOW POWER TO REACH THE LOGIC CIRCUIT FOR THE OPPOSITE FUNCTION. SINCE THER WOULD BE NO INPUTS TO THE LOGIC GATES THE FAILURE DOES NOT HAVE ANY EFFECT. THE SAME SITUATION OCCURS IF THE GPC MODE IS ACTIVE.

DATE: 8/18/87 HIGHEST CRITICALITY HDW/FUNC SUBSYSTEM: MECH/ETUD/EPD&C FLIGHT: 2/1R

MDAC ID: 3524 FLIGHT: 2/1R
ABORT: 2/1R

ITEM: RESISTOR, 5.1K 1/4W

FAILURE MODE: SHORTS, RESISTANCE LOWER THAN RATED VALUE

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) ET UMBILICAL DOOR EPD&C
- 3) AFT MOTOR CONTROL ASSEMBLY
- 4) RESISTOR, 5.1K 1/4W

5)

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	1	RTLS:	2/1R
LIFTOFF:	,	TAL:	2/1R
ONORBIT:	,	AOA:	2/1R
DEORBIT:	2/1R	ATO:	/
LANDING/SAFING:	2/1R		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: AFT AVIONICS BAYS 4, 5, 6

PART NUMBER: SEE REFERENCES

CAUSES: THERMAL STRESS, VIBRATION, CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE

EFFECTS/RATIONALE:

RESISTOR THAT SHORTS OR WITH RESISTANCE LOWER THAN RATED VALUE WOULD ALLOW EXCESSIVE CURRENT TO REACH OTHER COMPONENTS. CURRENT WOULD BE MORE THAN COMPONENTS WERE DESIGNED FOR. HIGHER CURRENT CAUSES LOSS OF COMPONENTS AND LOSS OF FUNCTION. REDUNDANT ELEMENTS WILL CONTINUE OPERATION BUT AT A REDUCED RATE. NO EFFECT ON CREW/VEHICLE OR MISSION.

DATE: 8/18/87 HIGHEST CRITICALITY HDW/FUNC SUBSYSTEM: MECH/ETUD/EPD&C FLIGHT: 2/1R

MDAC ID: 3525 ABORT: 2/1R

ITEM: RESISTOR, 5.1K 1/4W

FAILURE MODE: OPEN CIRCUIT

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) ET UMBILICAL DOOR EPD&C
- 3) AFT MOTOR CONTROL ASSEMBLY
- 4) RESISTOR, 5.1K 1/4W
- 5)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	7	RTLS:	2/1R
LIFTOFF:	/	TAL:	2/1R
ONORBIT:	/	AOA:	2/1R
DEORBIT:	2/1R	ATO:	/
LANDING/SAFING:	2/1R		•

REDUNDANCY SCREENS: A [1] B [F] C [P]

LOCATION: AFT AVIONICS BAYS 4, 5, 6

PART NUMBER: SEE REFERENCES

CAUSES: THERMAL STRESS, VIBRATION, CONTAMINATION, MECHANICAL

SHOCK, PIECE-PART FAILURE

EFFECTS/RATIONALE:

RESISTOR FAILURE AS AN OPEN CIRCUIT WOULD CAUSE A LOSS OF CURRENT TO OTHER COMPONENTS. THIS RESULTS IN A LOSS OF REDUNDANCY WHEN AFFECTED COMPONENT CANNOT OPERATE. REDUNDANT ELEMENTS WILL CONTINUE OPERATION BUT AT A REDUCED RATE. NO EFFECT ON CREW/VEHICLE OR MISSION.

HIGHEST CRITICALITY HDW/FUNC 8/18/87 FLIGHT: 2/1R SUBSYSTEM: MECH/ETUD/EPD&C 2/1R ABORT: MDAC ID: 3526

RESISTOR, 5.1K 1/4W ITEM:

FAILURE MODE: RESISTANCE HIGHER THAN RATED VALUE

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- ET UMBILICAL DOOR EPD&C 2)
- AFT MOTOR CONTROL ASSEMBLY 3)
- RESISTOR, 5.1K 1/4W 4)

5)

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	2/1R
LIFTOFF:	./	TAL:	2/1R
ONORBIT:	./	AOA:	2/1R
DEORBIT:	2/1R	ATO:	/
LANDING/SAFING:	2/1R		·

REDUNDANCY SCREENS: A [1] B [F] C [P]

AFT AVIONICS BAYS 4, 5, 6 LOCATION:

PART NUMBER: SEE REFERENCES

CAUSES: THERMAL STRESS, VIBRATION, CONTAMINATION, MECHANICAL

SHOCK, PIECE-PART FAILURE

EFFECTS/RATIONALE:

RESISTANCE HIGHER THAN RATED VALUE CAUSES A LOSS OF CURRENT. INPUT TO LOGIC GATE WOULD BE LESS THAN NOMINAL CAUSING A FALSE OUTPUT. RELAY WOULD NOT BE CLOSED CAUSING A LOSS OF A ACTUATOR MOTOR. REDUNDANT ELEMENT WOULD CONTINUE OPERATION WITH FUNCTION CONTINUING AT A SLOWER RATE. NO EFFECT ON CREW/VEHICLE OR MISSION.

HIGHEST CRITICALITY HDW/FUNC DATE: 8/18/87 SUBSYSTEM: MECH/ETUD/EPD&C FLIGHT: 2/1R

ABORT: 2/1R MDAC ID: 3527

ITEM: FUSE, 1A, TO ACTUATOR STATUS SWITCH

FAILURE MODE: BLOWN

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- ET UMBILICAL DOOR EPD&C 2)
- AFT MOTOR CONTROL ASSEMBLY 3)
- 4) FUSE, 1A, TO ACTUATOR STATUS SWITCH

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	,	RTLS:	3/3
LIFTOFF:	,	TAL:	2/1R
ONORBIT:	<i>,</i>	AOA:	2/1R
DEORBIT:	2/1R	ATO:	7
LANDING/SAFING	: 2/1R		•

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: AFT AVIONICS BAYS 4, 5, 6

PART NUMBER: F1, F4, F2, F1, F3, F2, F6, F5, F6, F1, F5, F7

CAUSES: VIBRATION, MECHANICAL SHOCK, PIECE-PART FAILURE

EFFECTS/RATIONALE:

FUSE FAILURE CAUSES AN OPEN CIRCUIT. EFFECT IS A LOSS OF INPUT TO LOGIC CIRCUIT CONTROLLING AC POWER RELAYS TO ACTUATOR MOTOR. OPEN CIRCUIT WILL SIGNAL PREMATURE COMPLETION OF ACTUATOR FUNCTION. REDUNDANT MOTOR WILL COMPLETE FUNCTION BUT AT A REDUCED RATE. WILL GET PREMATURE TELEMETRY INDICATION OF ACTUATOR STATUS FROM ONE PART OF PAIR. NO EFFECT ON CREW/VEHICLE OR MISSION.

DATE: 8/18/87 HIGHEST CRITICALITY HDW/FUNC SUBSYSTEM: MECH/ETUD/EPD&C FLIGHT: 2/1R MDAC ID: 3528 ABORT: 2/1R

ITEM: RESISTOR, 1.2K, TO MCA LOGIC SWITCH

FAILURE MODE: SHORTS, RESISTANCE LOWER THAN RATED VALUE

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) ET UMBILICAL DOOR EPD&C
- 3) CONTROL BUS
- 4) RESISTOR, 1.2K, TO MCA LOGIC SWITCH

5)

6) 7)

8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	,	RTLS:	2/1R
LIFTOFF:	,	TAL:	2/1R
ONORBIT:	7	AOA:	2/1R
DEORBIT:	2/1R	ATO:	/
LANDING/SAFING:	2/1R		•

LANDING/SAFING: 2/IR

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: PART NUMBER:

CAUSES: VIBRATION, MECHANICAL SHOCK, PIECE-PART FAILURE

EFFECTS/RATIONALE:

RESISTOR THAT SHORTS OR WITH RESISTANCE LOWER THAN RATED VALUE WOULD ALLOW EXCESSIVE CURRENT TO REACH RPC. THIS CAUSES RPC CURRENT LIMITING TO TRIP OUT. RPC LOSS CAUSES LOSS OF AMC AND ASSOCIATED MOTOR RELAYS. REDUNDANT ELEMENTS WOULD CONTINUE OPERATION WITH FUNCTION COMPLETED AT A REDUCED RATE. NO EFFECT ON CREW/VEHICLE OR MISSION.

DATE: 8/18/87 HIGHEST CRITICALITY HDW/FUNC SUBSYSTEM: MECH/ETUD/EPD&C FLIGHT: 2/1R MDAC ID: 3529 ABORT: 2/1R

ITEM: RESISTOR, 1.2K, TO MCA LOGIC SWITCH

FAILURE MODE: OPEN CIRCUIT

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) ET UMBILICAL DOOR EPD&C
- 3) CONTROL BUS
- 4) RESISTOR, 1.2K, TO MCA LOGIC SWITCH

5)

6) 7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	,	RTLS:	2/1R
LIFTOFF:	,	TAL:	2/1R
ONORBIT:	,	AOA:	2/1R
DEORBIT:	2/1R	ATO:	/
LANDING/SAFING:	2/1R		-

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:
PART NUMBER:

CAUSES: VIBRATION, MECHANICAL SHOCK, PIECE-PART FAILURE

EFFECTS/RATIONALE:

RESISTOR FAILURE AS AN OPEN CIRCUIT WOULD CAUSE A LOSS OF INPUT TO ASSOCIATED RPC. LOSS OF RPC IN TURN CAUSES LOSS OF AMC AND ASSOCIATED MOTOR RELAYS. REDUNDANT ELEMENTS WOULD CONTINUE OPERATION WITH FUNCTION COMPLETED AT A REDUCED RATE. NO EFFECT ON CREW/VEHICLE OR MISSION.

C.4

KU-BAND DEPLOY ANALYSIS WORKSHEETS

	CRITIC	ALITY	REDUNDANCY	
	FLIGHT	ABORT	SCREENS	
MDAC-ID	H/F	H/F	A B C	ITEM NAME
4101 *	1/1	3/3		GUILLOTINE/PRESSURE CARTRIDGE
4102 *	2/2	3/3		GUILLOTINE/PRESSURE CARTRIDGE
	1/1	3/3		NUT/BREECH
4104 *	1/1			NUT/BREECH
4105 *	2/1R	3/3	PPP	INPUT/OUTPUT SHAFT - HOUSING
4106 *	2/1R	3/3	PPP	INPUT/OUTPUT SHAFT - HOUSING
4107	3/1R	3/3	PPP	STOW LIMIT SWITCHES (S1 & 2)
4108	3/3	3/3		STOW LIMIT SWITCHES (S1 & 2)
4109 *	2/1R	3/3	PPP	DEPLOY LIMIT SWITCHES (S5 & 6)
4110 *	2/1R	3/3	PPP	DEPLOY LIMIT SWITCHES (S5 & 6)
4111 *	2/1R	3/3	PPP	GEAR TRAIN ASSEMBLY
4112 *	2/1R	3/3	PPP	
4113	3/3	3/3		ALL ITEMS NOT SHOWN ON MDAC ID
4500	3/3	/NA		+28V CONTACT #1
4501	3/3	/NA		+28V CONTACT #1
4502	3/3	/NA		+28V CONTACT #2
4503	3/3	/NA		+28V CONTACT #2 +28V CONTACT #2 +28V CONTACT #3 +28V CONTACT #3 +28V CONTACT #4
4504	3/3	/NA		+28V CONTACT #3
4505	3/3	/NA		+28V CONTACT #3
4506	3/3	/NA		+28V CONTACT #4
4507	3/3	/NA	D 20 D	+28V CONTACT #4
4508 *	3/2R	/NA	PrP	+28V CONTACT #1 +28V CONTACT #1
	3/1R	/NA	PrP	+28V CONTACT #1 +28V CONTACT #2
4510 *	3/2R	/NA		+28V CONTACT #2 +28V CONTACT #2
4511 * 4512 *	3/1R 3/2R	/ NA		+28V CONTACT #2
4512 * 4513 *	3/2R 3/1R	/NA	ם זים	+28V CONTACT #3
4514 *	3/2R	/NA	P P P P P P P P P P P P P P P P P P P	+28V CONTACT #4
4515 *	3/1R	/NA	PFP	+28V CONTACT #4
4516 *	3/1R	/NA	PFP	+28V CONTACT #1
4517 *	3/2R	/NA	PFP	+28V CONTACT #1
4518 *	3/1R	/NA	PFP	+28V CONTACT #2
4519 *	3/2R	/NA	PFP	+28V CONTACT #2
4520 *	3/1R	/NA		+28V CONTACT #3
4521 *	3/2R	/NA	PFP	+28V CONTACT #3
4522 *	3/1R	/NA	PFP	+28V CONTACT #4
4523 *	3/2R	/NA		+28V CONTACT #4
4524	3/3	/NA		+28V CONTACT #1
4525 *	3/2R	/NA	PFP	+28V CONTACT #1
4526	3/3	/NA		+28V CONTACT #2
4527 *	3/2R	/NA	PFP	+28V CONTACT #2
4528	3/3	/NA		+28V CONTACT #3
4529 *	3/2R	/NA	PFP	+28V CONTACT #3
4530	3/3	/NA		+28V CONTACT #4
4531 *	3/2R	/NA	PFP	+28V CONTACT #4

^(*) Potential Critical Items.

	CRITIC FLIGHT	ALITY ABORT	REDUNDANCY SCREENS	**.
MDAC-ID	H/F	H/F	A B C	ITEM NAME
4532 *	3/2R	/NA	P F P	+28V CONTACT #1
4533 *	3/1R	/NA	PFP	+28V CONTACT #1
4534 *	3/2R	/NA	PFP	+28V CONTACT #2
4535 *	3/1R	/NA	PFP	+28V CONTACT #2
4536 *	3/2R	/NA	PFP	+28V CONTACT #3
4537 *	3/1R	/NA	PFP	+28V CONTACT #3
4538 *	3/2R	/NA	PFP	+28V CONTACT #4
4539 *	3/1R	/NA	PFP	+28V CONTACT #4
4540	3/3	/NA		TALKBACK
4541	3/3	/NA		TALKBACK
4542	3/3	/NA		TALKBACK
4543 *	3/2R	/NA	PFP.	AND GATE #1
4544 *	3/1R	/NA	PFP	AND GATE #1
4545 *	3/2R	/NA	PFP	AND GATE #2
4546 *	3/1R	/NA	PFP	AND GATE #2
4547 *	3/1R	/NA	PFP	AND GATE #1
4548 *	3/2R	/NA	PFP	AND GATE #1
4549 *	3/1R	/NA	PFP	AND GATE #2
4550 *	3/2R	/NA	PFP	AND GATE #2
4551 *	3/2R	/NA	PFP	AMP #1
4552 *	3/1R	/NA	PFP	AMP #1
4553 *	3/2R	/NA	PFP	AMP #2
4554 *	3/1R	/NA	PFP	AMP #2
4555 *	3/1R	/NA	PFP	AMP #1 AMP #1
4556 * 4557 *	3/2R	/NA	P F P P F P	AMP #1 AMP #2
4558 *	3/1R 3/2R	/NA /NA	PFP	AMP #2
4559 *	3/2R 3/2R	/NA	PFP	K14
4560 *	3/1R	/NA	PFP	K14
4561 *	3/2R	/NA	PFP	K68
4562 *	3/1R	/NA	PFP	K68
4563 *	3/1R	/NA	PFP	K72
4564 *	3/2R	/NA	PFP	K72
4565 *	3/1R	/NA	PFP	K70
4566 *	3/2R	/NA	PFP	K70
4567 *	3/1R	/NA	PFP	STOW MICROSWITCH #1
4568	3/3	/NA		STOW MICROSWITCH #1
4569 *	3/2R	/NA	PFP	DEPLOY MICROSWITCH #1
4570	3/3	/NA		DEPLOY MICROSWITCH #1
4571 *	3/2R	/NA	PFP	AND GATE #1
4572 *	3/1R	/NA	PFP	AND GATE #1
4573 *	3/2R	/NA	PFP	AND GATE #2
4574 *	3/1R	/NA	PFP	AND GATE #2
4575 *	3/1R	/NA	PFP	AND GATE #1
4576 *	3/2R	/NA	PFP	AND GATE #1

^(*) Potential Critical Items.

	CRITIC	ALITY	REDUNDANCY	
	FLIGHT	ABORT	SCREENS	grand and the second of the se
MDAC-ID	H/F	H/F	ABC	ITEM NAME
4577 *	3/1R	/NA	PFP	AND GATE #2
4578 *	3/2R	/NA	PFP	AND GATE #2
4579 *	3/2R	/NA	PFP	AMP #1
4580 *	3/1R	/NA	PFP	AMP #1
4581 *	3/2R	/NA	PFP	AMP #2
	3/1R	/NA	PFP	AMP #2
	3/1R	/NA	PFP	AMP #1
	3/2R	/NA	PFP	AMP #1
	3/1R	/NA	PFP	AMP #2
	3/2R	/NA	PFP	AMP #2
	3/2R	/NA	PFP	K25
	3/1R	/NA	PFP	K25 · · · · · · · · · · · · · · · · · · ·
4589 *	3/2R	/NA	PFP	K2
4591 *	3/1R	/NA	PFP	K2
4592 *	3/1R	/NA	PFP	K27
4593 *	3/2R	/NA	PFP	K27
4594 *	3/1R	/ÑĀ		K37
4595 *	3/2R	/NA		K37
4596 *	3/1R	/NA		STOW MICROSWITCH #2
4597	3/3	/NA		STOW MICROSWITCH #2
4598 *	3/2R	/NA		DEPLOY MICROSWITCH #2
4599	3/3	/NA		DEPLOY MICROSWITCH #2
4600 *	3/1R	/NA		+28V CONTACT #1
4601 *	3/1R	/NA		+28V CONTACT #1
4602 *	3/1R	/NA		+28V CONTACT #2
4603 *	3/1R	/NA		+28V CONTACT #2
4604 *	3/1R	/NA		+28V CONTACT #3
4605 *	3/1R	/NA		+28V CONTACT #3
4606 * 4607 *	3/1R	/NA		+28V CONTACT #4
4608	3/1R	/NA		+28V CONTACT #4
4609	3/3 3/3	/NA /NA		+28V CONTACT #1
4610	3/3	/NA		+28V CONTACT #1 +28V CONTACT #2
4611	3/3	/NA		••
4612	3/3	/NA		+28V CONTACT #2 +28V CONTACT #3
4613	3/3	/NA		+28V CONTACT #3
4614	3/3	/NA		+28V CONTACT #4
4615	3/3	/NA		+28V CONTACT #4
4616 *	3/1R	/NA		+28V CONTACT #1
4617 *	3/1R	/NA		+28V CONTACT #1
4618 *	3/1R	/NA		+28V CONTACT #2
4619 *	3/1R	/NA		+28V CONTACT #2
4620	3/3	/NA		+28V CONTACT #1
4621	3/3	/NA		+28V CONTACT #1
4622	3/3	/NA		+28V CONTACT #2
	-	-		

^(*) Potential Critical Items.

FLIGHT ABORT SCREENS ## MDAC-ID H/F H/F A B C ITEM NAME ## A
##
4623
4624 * 3/1R
4626 * 3/1R /NA P F P AND GATE #2 4627 * 3/1R /NA P F P AND GATE #2 4628 * 3/1R /NA P F P 40 MS TIME DELAY 4629 * 3/1R /NA P F P 40 MS TIME DELAY 4630 * 3/1R /NA P F P AMP #1 4631 * 3/1R /NA P F P AMP #1 4632 * 3/1R /NA P F P AND GATE #3 4633 * 3/1R /NA P F P AND GATE #3 4634 * 3/1R /NA P F P AND GATE #3 4635 * 3/1R /NA P F P 4 SECOND TIME DELAY 4636 * 3/1R /NA P F P AMP #3 4637 * 3/1R /NA P F P AMP #3 4638 * 3/1R /NA P F P EXPLOSIVE INITIATOR 4639 * 3/1R /NA P F P EXPLOSIVE INITIATOR 4640 * 3/1R /NA P F P EXPLOSIVE INITIATOR 4641 * 3/1R /NA P F P EXPLOSIVE INITIATOR 4642 * 3/1R /NA P F P AND GATE #1 4643 * 3/1R /NA P F P AND GATE #1 4644 * 3/1R /NA P F P AND GATE #2 4645 * 3/1R /NA P F P AND GATE #2 4646 * 3/1R /NA P F P AND GATE #2 4646 * 3/1R /NA P F P AND GATE #2 4647 * 3/1R /NA P F P AND GATE #2 4648 * 3/1R /NA P F P AND GATE #3 4650 * 3/1R /NA P F P AND GATE #3 4651 * 3/1R /NA P F P AND GATE #3
4626 * 3/1R /NA P F P AND GATE #2 4627 * 3/1R /NA P F P AND GATE #2 4628 * 3/1R /NA P F P 40 MS TIME DELAY 4629 * 3/1R /NA P F P 40 MS TIME DELAY 4630 * 3/1R /NA P F P AMP #1 4631 * 3/1R /NA P F P AMP #1 4632 * 3/1R /NA P F P AND GATE #3 4633 * 3/1R /NA P F P AND GATE #3 4634 * 3/1R /NA P F P AND GATE #3 4635 * 3/1R /NA P F P 4 SECOND TIME DELAY 4636 * 3/1R /NA P F P AMP #3 4637 * 3/1R /NA P F P AMP #3 4638 * 3/1R /NA P F P EXPLOSIVE INITIATOR 4639 * 3/1R /NA P F P EXPLOSIVE INITIATOR 4640 * 3/1R /NA P F P EXPLOSIVE INITIATOR 4641 * 3/1R /NA P F P EXPLOSIVE INITIATOR 4642 * 3/1R /NA P F P AND GATE #1 4643 * 3/1R /NA P F P AND GATE #1 4644 * 3/1R /NA P F P AND GATE #1 4645 * 3/1R /NA P F P AND GATE #2 4646 * 3/1R /NA P F P AND GATE #2 4646 * 3/1R /NA P F P AND GATE #2 4646 * 3/1R /NA P F P AND GATE #2 4647 * 3/1R /NA P F P AND GATE #2 4648 * 3/1R /NA P F P AND GATE #3 4650 * 3/1R /NA P F P AND GATE #3 4651 * 3/1R /NA P F P AND GATE #3
4627 * 3/1R /NA P F P AND GATE #2 4628 * 3/1R /NA P F P 40 MS TIME DELAY 4629 * 3/1R /NA P F P 40 MS TIME DELAY 4630 * 3/1R /NA P F P AMP #1 4631 * 3/1R /NA P F P AMP #1 4632 * 3/1R /NA P F P AND GATE #3 4633 * 3/1R /NA P F P AND GATE #3 4634 * 3/1R /NA P F P 4 SECOND TIME DELAY 4635 * 3/1R /NA P F P 4 SECOND TIME DELAY 4636 * 3/1R /NA P F P AMP #3 4637 * 3/1R /NA P F P AMP #3 4638 * 3/1R /NA P F P EXPLOSIVE INITIATOR 4639 * 3/1R /NA P F P EXPLOSIVE INITIATOR 4640 * 3/1R /NA P F P EXPLOSIVE INITIATOR 4641 * 3/1R /NA P F P EXPLOSIVE INITIATOR 4642 * 3/1R /NA P F P AND GATE #1 4643 * 3/1R /NA P F P AND GATE #1 4644 * 3/1R /NA P F P AND GATE #2 4645 * 3/1R /NA P F P AND GATE #2 4646 * 3/1R /NA P F P AND GATE #2 4647 * 3/1R /NA P F P AND GATE #2 4648 * 3/1R /NA P F P AND GATE #2 4649 * 3/1R /NA P F P AND GATE #3 4650 * 3/1R /NA P F P AND GATE #3 4651 * 3/1R /NA P F P AND GATE #3
4628 * 3/1R /NA P F P 40 MS TIME DELAY 4629 * 3/1R /NA P F P 40 MS TIME DELAY 4630 * 3/1R /NA P F P AMP #1 4631 * 3/1R /NA P F P AMP #1 4632 * 3/1R /NA P F P AND GATE #3 4633 * 3/1R /NA P F P AND GATE #3 4634 * 3/1R /NA P F P 4 SECOND TIME DELAY 4635 * 3/1R /NA P F P 4 SECOND TIME DELAY 4636 * 3/1R /NA P F P AMP #3 4637 * 3/1R /NA P F P AMP #3 4638 * 3/1R /NA P F P EXPLOSIVE INITIATOR 4639 * 3/1R /NA P F P EXPLOSIVE INITIATOR 4640 * 3/1R /NA P F P EXPLOSIVE INITIATOR 4641 * 3/1R /NA P F P EXPLOSIVE INITIATOR 4642 * 3/1R /NA P F P EXPLOSIVE INITIATOR 4643 * 3/1R /NA P F P AND GATE #1 4644 * 3/1R /NA P F P AND GATE #1 4645 * 3/1R /NA P F P AND GATE #2 4646 * 3/1R /NA P F P AND GATE #2 4646 * 3/1R /NA P F P AND GATE #2 4647 * 3/1R /NA P F P AND GATE #2 4648 * 3/1R /NA P F P AND GATE #2 4649 * 3/1R /NA P F P AMP #1 4650 * 3/1R /NA P F P AMP #1 4650 * 3/1R /NA P F P AND GATE #3 4651 * 3/1R /NA P F P AND GATE #3
4629 * 3/1R /NA P F P 40 MS TIME DELAY 4630 * 3/1R /NA P F P AMP #1 4631 * 3/1R /NA P F P AMP #1 4632 * 3/1R /NA P F P AND GATE #3 4633 * 3/1R /NA P F P AND GATE #3 4634 * 3/1R /NA P F P 4 SECOND TIME DELAY 4635 * 3/1R /NA P F P 4 SECOND TIME DELAY 4636 * 3/1R /NA P F P AMP #3 4637 * 3/1R /NA P F P AMP #3 4638 * 3/1R /NA P F P EXPLOSIVE INITIATOR 4639 * 3/1R /NA P F P EXPLOSIVE INITIATOR 4640 * 3/1R /NA P F P EXPLOSIVE INITIATOR 4641 * 3/1R /NA P F P EXPLOSIVE INITIATOR 4642 * 3/1R /NA P F P AND GATE #1 4643 * 3/1R /NA P F P AND GATE #1 4644 * 3/1R /NA P F P AND GATE #2 4645 * 3/1R /NA P F P AND GATE #2 4646 * 3/1R /NA P F P AND GATE #2 4647 * 3/1R /NA P F P AND GATE #2 4648 * 3/1R /NA P F P AND GATE #2 4649 * 3/1R /NA P F P AMP #1 4650 * 3/1R /NA P F P AMP #1 4650 * 3/1R /NA P F P AND GATE #3 4651 * 3/1R /NA P F P AND GATE #3
4630 * 3/1R /NA P F P AMP #1 4631 * 3/1R /NA P F P AMP #1 4632 * 3/1R /NA P F P AND GATE #3 4633 * 3/1R /NA P F P AND GATE #3 4634 * 3/1R /NA P F P AND GATE #3 4635 * 3/1R /NA P F P 4 SECOND TIME DELAY 4636 * 3/1R /NA P F P AMP #3 4637 * 3/1R /NA P F P AMP #3 4638 * 3/1R /NA P F P AMP #3 4638 * 3/1R /NA P F P EXPLOSIVE INITIATOR 4639 * 3/1R /NA P F P EXPLOSIVE INITIATOR 4640 * 3/1R /NA P F P EXPLOSIVE INITIATOR 4641 * 3/1R /NA P F P EXPLOSIVE INITIATOR 4642 * 3/1R /NA P F P AND GATE #1 4643 * 3/1R /NA P F P AND GATE #1 4644 * 3/1R /NA P F P AND GATE #2 4645 * 3/1R /NA P F P AND GATE #2 4646 * 3/1R /NA P F P AND GATE #2 4647 * 3/1R /NA P F P AND GATE #2 4648 * 3/1R /NA P F P AMP #1 4649 * 3/1R /NA P F P AMP #1 4650 * 3/1R /NA P F P AMP #1 4650 * 3/1R /NA P F P AMP #1 4650 * 3/1R /NA P F P AND GATE #3
4631 * 3/1R /NA P F P AMP #1 4632 * 3/1R /NA P F P AND GATE #3 4633 * 3/1R /NA P F P AND GATE #3 4634 * 3/1R /NA P F P AND GATE #3 4635 * 3/1R /NA P F P 4 SECOND TIME DELAY 4635 * 3/1R /NA P F P AMP #3 4637 * 3/1R /NA P F P AMP #3 4638 * 3/1R /NA P F P EXPLOSIVE INITIATOR 4639 * 3/1R /NA P F P EXPLOSIVE INITIATOR 4640 * 3/1R /NA P F P EXPLOSIVE INITIATOR 4641 * 3/1R /NA P F P EXPLOSIVE INITIATOR 4642 * 3/1R /NA P F P AND GATE #1 4643 * 3/1R /NA P F P AND GATE #1 4644 * 3/1R /NA P F P AND GATE #2 4645 * 3/1R /NA P F P AND GATE #2 4646 * 3/1R /NA P F P AND GATE #2 4647 * 3/1R /NA P F P AND GATE #2 4648 * 3/1R /NA P F P AND GATE #2 4649 * 3/1R /NA P F P AND GATE #3 4650 * 3/1R /NA P F P AND GATE #3 4651 * 3/1R /NA P F P AND GATE #3
4632 * 3/1R /NA P F P AND GATE #3 4633 * 3/1R /NA P F P AND GATE #3 4634 * 3/1R /NA P F P AND GATE #3 4635 * 3/1R /NA P F P 4 SECOND TIME DELAY 4636 * 3/1R /NA P F P AMP #3 4637 * 3/1R /NA P F P AMP #3 4638 * 3/1R /NA P F P EXPLOSIVE INITIATOR 4639 * 3/1R /NA P F P EXPLOSIVE INITIATOR 4640 * 3/1R /NA P F P EXPLOSIVE INITIATOR 4641 * 3/1R /NA P F P EXPLOSIVE INITIATOR 4642 * 3/1R /NA P F P AND GATE #1 4643 * 3/1R /NA P F P AND GATE #1 4644 * 3/1R /NA P F P AND GATE #2 4645 * 3/1R /NA P F P AND GATE #2 4646 * 3/1R /NA P F P AND GATE #2 4647 * 3/1R /NA P F P 40 MS TIME DELAY 4648 * 3/1R /NA P F P 40 MS TIME DELAY 4649 * 3/1R /NA P F P AMP #1 4650 * 3/1R /NA P F P AMP #1 4650 * 3/1R /NA P F P AND GATE #3 4651 * 3/1R /NA P F P AND GATE #3
4633 * 3/1R /NA P F P AND GATE #3 4634 * 3/1R /NA P F P 4 SECOND TIME DELAY 4635 * 3/1R /NA P F P 4 SECOND TIME DELAY 4636 * 3/1R /NA P F P AMP #3 4637 * 3/1R /NA P F P AMP #3 4638 * 3/1R /NA P F P EXPLOSIVE INITIATOR 4639 * 3/1R /NA P F P EXPLOSIVE INITIATOR 4640 * 3/1R /NA P F P EXPLOSIVE INITIATOR 4641 * 3/1R /NA P F P EXPLOSIVE INITIATOR 4642 * 3/1R /NA P F P AND GATE #1 4643 * 3/1R /NA P F P AND GATE #1 4644 * 3/1R /NA P F P AND GATE #2 4645 * 3/1R /NA P F P AND GATE #2 4646 * 3/1R /NA P F P AND GATE #2 4647 * 3/1R /NA P F P AND GATE #2 4648 * 3/1R /NA P F P AND GATE #3 4650 * 3/1R /NA P F P AMP #1 4650 * 3/1R /NA P F P AND GATE #3 4651 * 3/1R /NA P F P AND GATE #3
4634 * 3/1R /NA P F P 4 SECOND TIME DELAY 4635 * 3/1R /NA P F P 4 SECOND TIME DELAY 4636 * 3/1R /NA P F P AMP #3 4637 * 3/1R /NA P F P AMP #3 4638 * 3/1R /NA P F P EXPLOSIVE INITIATOR 4639 * 3/1R /NA P F P EXPLOSIVE INITIATOR 4640 * 3/1R /NA P F P EXPLOSIVE INITIATOR 4641 * 3/1R /NA P F P EXPLOSIVE INITIATOR 4642 * 3/1R /NA P F P AND GATE #1 4643 * 3/1R /NA P F P AND GATE #1 4644 * 3/1R /NA P F P AND GATE #2 4645 * 3/1R /NA P F P AND GATE #2 4646 * 3/1R /NA P F P AND GATE #2 4646 * 3/1R /NA P F P AND GATE #2 4647 * 3/1R /NA P F P AND GATE #2 4648 * 3/1R /NA P F P AMP #1 4649 * 3/1R /NA P F P AMP #1 4650 * 3/1R /NA P F P AMP #1 4650 * 3/1R /NA P F P AND GATE #3 4651 * 3/1R /NA P F P AND GATE #3
4635 * 3/1R /NA P F P 4 SECOND TIME DELAY 4636 * 3/1R /NA P F P AMP #3 4637 * 3/1R /NA P F P AMP #3 4638 * 3/1R /NA P F P EXPLOSIVE INITIATOR 4639 * 3/1R /NA P F P EXPLOSIVE INITIATOR 4640 * 3/1R /NA P F P EXPLOSIVE INITIATOR 4641 * 3/1R /NA P F P EXPLOSIVE INITIATOR 4642 * 3/1R /NA P F P AND GATE #1 4643 * 3/1R /NA P F P AND GATE #1 4644 * 3/1R /NA P F P AND GATE #2 4645 * 3/1R /NA P F P AND GATE #2 4646 * 3/1R /NA P F P AND GATE #2 4646 * 3/1R /NA P F P AND GATE #2 4647 * 3/1R /NA P F P AND GATE #2 4648 * 3/1R /NA P F P AND GATE #2 4649 * 3/1R /NA P F P AMP #1 4650 * 3/1R /NA P F P AMP #1 4650 * 3/1R /NA P F P AMP #1 4650 * 3/1R /NA P F P AND GATE #3 4651 * 3/1R /NA P F P AND GATE #3
4636 * 3/1R /NA P F P AMP #3 4637 * 3/1R /NA P F P AMP #3 4638 * 3/1R /NA P F P EXPLOSIVE INITIATOR 4639 * 3/1R /NA P F P EXPLOSIVE INITIATOR 4640 * 3/1R /NA P F P EXPLOSIVE INITIATOR 4641 * 3/1R /NA P F P EXPLOSIVE INITIATOR 4642 * 3/1R /NA P F P AND GATE #1 4643 * 3/1R /NA P F P AND GATE #1 4644 * 3/1R /NA P F P AND GATE #2 4645 * 3/1R /NA P F P AND GATE #2 4646 * 3/1R /NA P F P AND GATE #2 4647 * 3/1R /NA P F P 40 MS TIME DELAY 4648 * 3/1R /NA P F P AMP #1 4649 * 3/1R /NA P F P AMP #1 4650 * 3/1R /NA P F P AND GATE #3 4651 * 3/1R /NA P F P AND GATE #3
4637 * 3/1R /NA P F P AMP #3 4638 * 3/1R /NA P F P EXPLOSIVE INITIATOR 4639 * 3/1R /NA P F P EXPLOSIVE INITIATOR 4640 * 3/1R /NA P F P EXPLOSIVE INITIATOR 4641 * 3/1R /NA P F P EXPLOSIVE INITIATOR 4642 * 3/1R /NA P F P AND GATE #1 4643 * 3/1R /NA P F P AND GATE #1 4644 * 3/1R /NA P F P AND GATE #2 4645 * 3/1R /NA P F P AND GATE #2 4646 * 3/1R /NA P F P AND GATE #2 4646 * 3/1R /NA P F P 40 MS TIME DELAY 4647 * 3/1R /NA P F P 40 MS TIME DELAY 4648 * 3/1R /NA P F P AMP #1 4650 * 3/1R /NA P F P AMP #1 4650 * 3/1R /NA P F P AND GATE #3 4651 * 3/1R /NA P F P AND GATE #3
4638 * 3/1R /NA P F P EXPLOSIVE INITIATOR 4639 * 3/1R /NA P F P EXPLOSIVE INITIATOR 4640 * 3/1R /NA P F P EXPLOSIVE INITIATOR 4641 * 3/1R /NA P F P EXPLOSIVE INITIATOR 4642 * 3/1R /NA P F P AND GATE #1 4643 * 3/1R /NA P F P AND GATE #1 4644 * 3/1R /NA P F P AND GATE #2 4645 * 3/1R /NA P F P AND GATE #2 4646 * 3/1R /NA P F P 40 MS TIME DELAY 4647 * 3/1R /NA P F P 40 MS TIME DELAY 4648 * 3/1R /NA P F P AMP #1 4649 * 3/1R /NA P F P AMP #1 4650 * 3/1R /NA P F P AND GATE #3 4651 * 3/1R /NA P F P AND GATE #3
4643 * 3/1R /NA P F P AND GATE #1 4644 * 3/1R /NA P F P AND GATE #2 4645 * 3/1R /NA P F P AND GATE #2 4646 * 3/1R /NA P F P 40 MS TIME DELAY 4647 * 3/1R /NA P F P 40 MS TIME DELAY 4648 * 3/1R /NA P F P AMP #1 4649 * 3/1R /NA P F P AMP #1 4650 * 3/1R /NA P F P AND GATE #3 4651 * 3/1R /NA P F P AND GATE #3
4643 * 3/1R /NA P F P AND GATE #1 4644 * 3/1R /NA P F P AND GATE #2 4645 * 3/1R /NA P F P AND GATE #2 4646 * 3/1R /NA P F P 40 MS TIME DELAY 4647 * 3/1R /NA P F P 40 MS TIME DELAY 4648 * 3/1R /NA P F P AMP #1 4649 * 3/1R /NA P F P AMP #1 4650 * 3/1R /NA P F P AND GATE #3 4651 * 3/1R /NA P F P AND GATE #3
4643 * 3/1R /NA P F P AND GATE #1 4644 * 3/1R /NA P F P AND GATE #2 4645 * 3/1R /NA P F P AND GATE #2 4646 * 3/1R /NA P F P 40 MS TIME DELAY 4647 * 3/1R /NA P F P 40 MS TIME DELAY 4648 * 3/1R /NA P F P AMP #1 4649 * 3/1R /NA P F P AMP #1 4650 * 3/1R /NA P F P AND GATE #3 4651 * 3/1R /NA P F P AND GATE #3
4643 * 3/1R /NA P F P AND GATE #1 4644 * 3/1R /NA P F P AND GATE #2 4645 * 3/1R /NA P F P AND GATE #2 4646 * 3/1R /NA P F P 40 MS TIME DELAY 4647 * 3/1R /NA P F P 40 MS TIME DELAY 4648 * 3/1R /NA P F P AMP #1 4649 * 3/1R /NA P F P AMP #1 4650 * 3/1R /NA P F P AND GATE #3 4651 * 3/1R /NA P F P AND GATE #3
4643 * 3/1R /NA P F P AND GATE #1 4644 * 3/1R /NA P F P AND GATE #2 4645 * 3/1R /NA P F P AND GATE #2 4646 * 3/1R /NA P F P 40 MS TIME DELAY 4647 * 3/1R /NA P F P 40 MS TIME DELAY 4648 * 3/1R /NA P F P AMP #1 4649 * 3/1R /NA P F P AMP #1 4650 * 3/1R /NA P F P AND GATE #3 4651 * 3/1R /NA P F P AND GATE #3
4644 * 3/1R /NA P F P AND GATE #2 4645 * 3/1R /NA P F P AND GATE #2 4646 * 3/1R /NA P F P 40 MS TIME DELAY 4647 * 3/1R /NA P F P 40 MS TIME DELAY 4648 * 3/1R /NA P F P AMP #1 4649 * 3/1R /NA P F P AMP #1 4650 * 3/1R /NA P F P AND GATE #3 4651 * 3/1R /NA P F P AND GATE #3
4645 * 3/1R /NA P F P AND GATE #2 4646 * 3/1R /NA P F P 40 MS TIME DELAY 4647 * 3/1R /NA P F P 40 MS TIME DELAY 4648 * 3/1R /NA P F P AMP #1 4649 * 3/1R /NA P F P AMP #1 4650 * 3/1R /NA P F P AND GATE #3 4651 * 3/1R /NA P F P AND GATE #3
4646 * 3/1R /NA P F P 40 MS TIME DELAY 4647 * 3/1R /NA P F P 40 MS TIME DELAY 4648 * 3/1R /NA P F P AMP #1 4649 * 3/1R /NA P F P AMP #1 4650 * 3/1R /NA P F P AND GATE #3 4651 * 3/1R /NA P F P AND GATE #3
4647 * 3/1R /NA P F P 40 MS TIME DELAY 4648 * 3/1R /NA P F P AMP #1 4649 * 3/1R /NA P F P AMP #1 4650 * 3/1R /NA P F P AND GATE #3 4651 * 3/1R /NA P F P AND GATE #3
4648 * 3/1R /NA P F P AMP #1 4649 * 3/1R /NA P F P AMP #1 4650 * 3/1R /NA P F P AND GATE #3 4651 * 3/1R /NA P F P AND GATE #3
4649 * 3/1R /NA P F P AMP #1 4650 * 3/1R /NA P F P AND GATE #3 4651 * 3/1R /NA P F P AND GATE #3
4650 * 3/1R /NA P F P AND GATE #3 4651 * 3/1R /NA P F P AND GATE #3
4651 * 3/1R /NA P F P AND GATE #3
4653 * 3/1R /NA P F P 4 SECOND TIME DELAY
4654 * 3/1R /NA P F P AMP #3
4655 * 3/1R /NA P F P AMP #3 4656 * 3/1R /NA P F P FYDIOSIVE INITIATION
4656 * 3/1R /NA P F P EXPLOSIVE INITIATOR
4657 * 3/1R /NA P F P EXPLOSIVE INITIATOR
4658 * 3/1R /NA P F P EXPLOSIVE INITIATOR
4659 * 3/1R /NA P F P EXPLOSIVE INITIATOR
4660 * 3/1R /NA P F P AMP #2
4661 * 3/1R /NA P F P AMP #2
4662 * 3/1R /NA P F P AMP #2
4663 * 3/1R /NA P F P AMP #2
4664 * 3/1R /NA P F P CONVERTER
4665 * 3/1R /NA P F P CONVERTER
4666 * 3/1R /NA P F P INVERTED AND GATE
4667 * 3/1R /NA P F P INVERTED AND GATE

^(*) Potential Critical Items.

		ALITY	REDUN		•
MDAC-ID	FLIGHT H/F	ABORT H/F			ITEM NAME
MDAC ID					TIEM NAME
4668 *	3/1R	/NA	ΡF	P	CAPACITOR BANK
4669 *	3/1R	/NA	PF	P	CAPACITOR BANK
4670 *	3/1R	/NA	PF	P	AND GATE
4671 *	3/1R	/NA	P F	P	AND GATE
4672	3/3	/NA			AMP
4673	3/3	/NA			AMP
4674 *	3/1R	/NA		P	
4675 *	3/1R	/NA		P	
4676 *	3/1R	/NA		P	
4677 *	3/1R	/NA		P	
4678 *	3/1R	/NA		P	
4679 *	3/1R	/NA		P	
4680 *	3/1R	/NA		P	
4681 *	3/1R	/NA		P	
4682 *	3/1R	/NA		P	
4683 *	3/1R	/NA	,, P F	P	AND GATE
4684	3/3	/NA			AMP
4685	3/3	/NA		_	AMP
4686 *	3/1R	/NA	PF	P	TEST LOGIC
4687 *	3/1R	/NA	PF	P	TEST LOGIC

^(*) Potential Critical Items.

DATE: 6/26/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: MECH/KBD FLIGHT: 1/1 MDAC ID: 4101 ABORT: 3/3

ITEM: GUILLOTINE/PRESSURE CARTRIDGE

FAILURE MODE: FAILS MID-TRAVEL, FAILS TO CLOSE, INTERNAL

LEAKAGE, PHYSICAL BINDING/JAMMING, STRUCTURAL FAILURE (RUPTURE),

PARTIAL OUTPUT

LEAD ANALYST: H.J. LOWERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND ANTENNA DEPLOYMENT SUBSYSTEM
- 3) DEPLOYMENT MECHANISM
- 4) JETTISON ASSEMBLY
- 5) GUILLOTINE/PRESSURE CARTRIDGE
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	1/1	ATO:	3/3
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: KU-BAND ANTENNA
PART NUMBER: SKD26100105-201/301

CAUSES: CONTAMINATION, PIECE-PART FAILURE, STRUCTURAL FAILURE,

JAMMED

EFFECTS/RATIONALE:

UNABLE TO PROPERLY SECURE/EJECT THE ANTENNA. ANTENNA WOULD BE SECURED BY ONLY THE CABLE OR PARTIAL CABLE. EVA WOULD BE REQUIRED TO SEVER THE CABLE AND EJECT THE DEPLOYMENT MECHANISM OR PROPERLY SECURE THE DEPLOYMENT MECHANISM.

HIGHEST CRITICALITY HDW/FUNC 6/26/87 DATE: FLIGHT: 2/2 SUBSYSTEM: MECH/KBD ABORT: 3/3 MDAC ID: 4102 GUILLOTINE/PRESSURE CARTRIDGE ITEM: FAILURE MODE: PREMATURE OPERATION LEAD ANALYST: H.J. LOWERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM KU-BAND ANTENNA DEPLOYMENT SUBSYSTEM DEPLOYMENT MECHANISM 3) 4) JETTISON ASSEMBLY 5) GUILLOTINE/PRESSURE CARTRIDGE 6) 7) 8) 9) CRITICALITIES ### CRITICALITIES

HDW/FUNC ABORT HDW/FUNC

2/2 RTLS: 3/3

2/2 TAL: 3/3

2/2 AOA: 3/3

3/3 ATO: 3/3 FLIGHT PHASE PRELAUNCH: 2/2
LIFTOFF: 2/2
ONORBIT: 2/2
DEORBIT: 3/3
LANDING/SAFING: 3/3 REDUNDANCY SCREENS: A [] B [] C [] LOCATION: KU-BAND ANTENNA PART NUMBER: SKD26100105-201/301 CAUSES: ERRONEOUS INPUT, MECHANICAL SHOCK, TEMPERATURE, ACCELERATION, ELECTROMAGNETIC FIELDS, VIBRATION, INADVERTENT OPERATION/ACTIVATION EFFECTS/RATIONALE: LOSS OF KU-BAND COMMUNICATION SYSTEM. DEPENDING ON MISSION REQUIREMENTS, COULD MEAN LOSS OF MISSION. REFERENCES: V070-544901,2,3, SSSH DWG NO 15.7/16.5 SHEET 1 & 2, SKD26100105, MC287-0026-0002, VS72-956099 SHEET 63 & 64

DATE: 6/26/87 HIGHEST CRITICALITY HDW/FUNC SUBSYSTEM: MECH/KBD FLIGHT: 1/1 MDAC ID: 4103 ABORT: 3/3

ITEM: NUT/BREECH

FAILURE MODE: INTERNAL/EXTERNAL LEAKAGE, PHYSICAL

BINDING/JAMMING, RESTRICTED FLOW, STRUCTURAL FAILURE (RUPTURE),

PARTIAL OUTPUT

LEAD ANALYST: H.J. LOWERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND ANTENNA DEPLOYMENT SUBSYSTEM
- 3) DEPLOYMENT MECHANISM
- 4) JETTISON ASSEMBLY
- 5) NUT/BREECH

6)

7)

8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC		
PRELAUNCH:	3/3	RTLS:	3/3		
LIFTOFF:	3/3	TAL:	3/3		
ONORBIT:	3/3	AOA:	3/3		
DEORBIT:	1/1	ATO:	3/3		
LANDING/SAFING:	: 3/3		·		

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: KU-BAND ANTENNA
PART NUMBER: SKD26100105-501/601

CAUSES: PIECE-PART FAILURE, STRUCTURAL FAILURE, JAMMED

EFFECTS/RATIONALE:

UNABLE TO PROPERLY SECURE/EJECT THE ANTENNA. EVA WORK AROUND WOULD BE REQUIRED TO PROPERLY SECURE/EJECT THE DEPLOYMENT MECHANISM.

DATE: 6/26/87 SUBSYSTEM: MECH/KBD MDAC ID: 4104	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 1/1 ABORT: 1/1				
ITEM: NUT/BREECH FAILURE MODE: PREMATURE OPERATION	to the state of th				
LEAD ANALYST: H.J. LOWERY SUBS	YS LEAD: H.J. LOWERY				
BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) KU-BAND ANTENNA DEPLOYMENT SUBSYSTEM 3) DEPLOYMENT MECHANISM 4) JETTISON ASSEMBLY 5) NUT/BREECH 6) 7) 8)					
CRITICALI	TIES				
FLIGHT PHASE HDW/FUNC PRELAUNCH: 2/2 LIFTOFF: 1/1 ONORBIT: 1/1 DEORBIT: 1/1 LANDING/SAFING: 3/3	ABORT HDW/FUNC RTLS: 1/1 TAL: 1/1 AOA: 1/1 ATO: 1/1				
REDUNDANCY SCREENS: A [] B					
LOCATION: KU-BAND ANTENNA PART NUMBER: SKD26100105-601/501					
CAUSES: ERRONEOUS INPUT, MECHANICAL SHOCK, TEMPERATURE, ACCELERATION, ELECTROMAGNETIC FIELDS, VIBRATION, INADVERTENT OPERATION/ACTIVATION					
EFFECTS/RATIONALE: UNABLE TO PROPERLY SECURE/EJECT THE ANTENNA. ANTENNA WOULD BE SECURED BY ONLY THE CABLE OR PARTIAL CABLE. EVA WOULD BE REQUIRED TO SEVER THE CABLE AND EJECT THE DEPLOYMENT MECHANISM OR PROPERLY SECURE THE DEPLOYMENT MECHANISM.					

DATE: 6/26/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: MECH/KBD FLIGHT: 2/1R MDAC ID: 4105 ABORT: 3/3

ITEM: INPUT/OUTPUT SHAFT - HOUSING

FAILURE MODE: PHYSICAL BINDING/JAMMING, STRUCTURAL FAILURE

(RUPTURE)

LEAD ANALYST: H.J. LOWERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND ANTENNA DEPLOYMENT SUBSYSTEM
- 3) DEPLOYMENT MECHANISM
- 4) DEPLOYMENT ASSEMBLY
- 5) INPUT/OUTPUT SHAFT-HOUSING
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/2R	AOA:	3/3
DEORBIT:	2/1R	ATO:	3/3
LANDING/SAFING:	•	•	•

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: KU-BAND ANTENNA

PART NUMBER: TBD

CAUSES: CONTAMINATION, MECHANICAL SHOCK, MISHANDLING/ABUSE, OVERLOAD, PIECE-PART FAILURE, STRUCTURAL FAILURE, TEMPERATURE, THERMAL SHOCK, ACCCELERATION, VIBRATION

EFFECTS/RATIONALE:

UNABLE TO DEPLOY/STOW THE ANTENNA. INHIBIT KU-BAND COMMUNICATION SYSTEM POSSIBLY PLBD CLOSURE.

DATE:

6/26/87

HIGHEST CRITICALITY HDW/FUNC

MDAC ID:

SUBSYSTEM: MECH/KBD

FLIGHT:

2/1R

4106

ABORT:

3/3

ITEM:

INPUT/OUTPUT SHAFT - HOUSING

FAILURE MODE: FAILS TO START/STOP AS COMMANDED & ROTATES FREELY

IN DEPLOYMENT PLANE.

LEAD ANALYST: H.J. LOWERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- KU-BAND ANTENNA DEPLOYMENT SUBSYSTEM 2)
- 3) DEPLOYMENT MECHANISM
- 4) DEPLOYMENT ASSEMBLY
- INPUT/OUTPUT SHAFT-HOUSING 5)

7)

8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/2R	AOA:	3/3
DEORBIT:	2/1R	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION:

KU-BAND ANTENNA

PART NUMBER: TBD

CAUSES: CONTAMINATION, MECHANICAL SHOCK, MISHANDLING/ABUSE, OVERLOAD, PIECE-PART FAILURE, STRUCTURAL FAILURE, TEMPERATURE, THERMAL SHOCK, ACCCELERATION, VIBRATION

EFFECTS/RATIONALE:

UNABLE TO DEPLOY/STOW THE ANTENNA. INHIBIT KU-BAND COMMUNICATION SYSTEM POSSIBLY PLBD CLOSURE.

DATE: 6/26/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: MECH/KBD FLIGHT: 3/1R MDAC ID: 4107 ABORT: 3/3

ITEM: STOW LIMIT SWITCHES (S1 & 2) ACTUATOR

FAILURE MODE: FAILS TO REMAIN OPEN, FAILS TO OPEN, PREMATURE

OPERATION, SHORTED

LEAD ANALYST: H.J. LOWERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND ANTENNA DEPLOYMENT SUBSYSTEM
- 3) DEPLOYMENT MECHANISM
- 4) DEPLOYMENT ASSEMBLY
- 5) STOW LIMIT SWITCHES (S1 & S)
- 6)
- 7)
- 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	•		•

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: DEPLOYMENT ASSEMBLY PART NUMBER: S 1 & 2, V070-544903

CAUSES: ACOUSTICS, CONTAMINATION, PIECE-PART FAILURE, TEMPERATURE, THERMAL SHOCK, VIBRATION, INADVERTENT OPERATION/ACTIVATION

EFFECTS/RATIONALE:

SWITCH INDICATES ANTENNA STOWED WHEN IT MAY BE DEPLOYED. IF THE ANTENNA IS DEPLOYED, STOW CAPABILITY WOULD BE INHIBITED.

HIGHEST CRITICALITY HDW/FUNC DATE: 6/26/87 SUBSYSTEM: MECH/KBD FLIGHT: 3/3 MDAC ID: 4108 ABORT: 3/3 STOW LIMIT SWITCHES (S1 & 2) ACTUATOR ITEM: FAILURE MODE: FAILS TO REMAIN CLOSED, FAILS TO CLOSE, PREMATURE OPERATION, OPEN (ELECTRICAL) LEAD ANALYST: H.J. LOWERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: MECHANICAL ACTUATION SYSTEM KU-BAND ANTENNA DEPLOYMENT SUBSYSTEM 2) 3) DEPLOYMENT MECHANISM 4) DEPLOYMENT ASSEMBLY 5) STOW LIMIT SWITCHES (S1 & S) 6) 7) 8) 9) CRITICALITIES FLIGHT PHASE HDW/FUNC ABORT HDW/FUNC PRELAUNCH: 3/3 RTLS: 3/3 3/3 3/3 TAL: LIFTOFF: 3/3 AOA: ONORBIT: 3/3 DEORBIT: 3/3 ATO: 3/3 LANDING/ŚAFING: 3/3 REDUNDANCY SCREENS: A [] B [] C [] LOCATION: DEPLOYMENT ASSEMBLY ---PART NUMBER: S 1 & 2, V070-544903

CAUSES: ACOUSTICS, CONTAMINATION, PIECE-PART FAILURE,

TEMPERATURE, THERMAL SHOCK, VIBRATION, INADVERTENT

OPERATION/ACTIVATION

EFFECTS/RATIONALE:

SWITCH INDICATES ANTENNA NOT STOWED WHEN IT MAY BE PROPERLY SECURED. MOTORS WOULD CONTINUE TO TURN UNTIL OFF COMMAND IS TRANSMITTED. CREW WOULD BE REQUIRED TO DETERMINE CONFIGURATION.

HIGHEST CRITICALITY HDW/FUNC 6/26/87 DATE:

FLIGHT: 2/1R SUBSYSTEM: MECH/KBD ABORT: 3/3 4109 MDAC ID:

DEPLOY LIMIT SWITCHES (S5 & 6) ITEM:

FAILURE MODE: FAILS TO REMAIN OPEN, FAILS TO OPEN, PREMATURE

OPERATION, SHORTED

LEAD ANALYST: H.J. LOWERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- MECHANICAL ACTUATION SYSTEM
- KU-BAND ANTENNA DEPLOYMENT SUBSYSTEM 2)
- 3) DEPLOYMENT MECHANISM
- 4) DEPLOYMENT ASSEMBLY
- DEPLOY LIMIT SWITCHES (S5 & 6) 5)

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: DEPLOYMENT ASSEMBLY PART NUMBER: S5 & S6, V070-54903

CAUSES: ACOUSTICS, CONTAMINATION, PIECE-PART FAILURE, TEMPERATURE, THERMAL SHOCK, VIBRATION, INADVERTENT OPERATION/ACTIVATION

EFFECTS/RATIONALE:

SWITCH INDICATES ANTENNA DEPLOYED WHEN IT MAY BE STOWED. ANTENNA IS STOWED, DEPLOYMENT CAPABILITY WOULD BE INHIBITED. THE ANTENNA IS PARTIALLY DEPLOYED AND KU POWER ON POSSIBLE ORBITER IMPACT WITH ANTENNA INITIALIZATION INITIATION.

DATE: HIGHEST CRITICALITY HDW/FUNC 6/26/87

SUBSYSTEM: MECH/KBD FLIGHT: 2/1R 3/3 MDAC ID: 4110 ABORT:

ITEM: DEPLOY LIMIT SWITCHES (S5 & 6)

FAILURE MODE: FAILS TO REMAIN CLOSED, FAILS TO CLOSE, PREMATURE

OPERATION, OPEN (ELECTRICAL)

LEAD ANALYST: H.J. LOWERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- MECHANICAL ACTUATION SYSTEM
- KU-BAND ANTENNA DEPLOYMENT SUBSYSTEM 2)
- DEPLOYMENT MECHANISM 3)
- 4) DEPLOYMENT ASSEMBLY
- DEPLOY LIMIT SWITCHES (S5 & 6)

6)

7)

8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	2/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [2] B [P] C [P]

DEPLOYMENT ASSEMBLY LOCATION: PART NUMBER: S5 & S6, V070-54903

CAUSES: ACOUSTICS, CONTAMINATION, PIECE-PART FAILURE, TEMPERATURE, THERMAL SHOCK, VIBRATION, INADVERTENT OPERATION/ACTIVATION

EFFECTS/RATIONALE:

SWITCH INDICATES ANTENNA NOT DEPLOYED WHEN IT MAY BE DEPLOYED. MOTORS WOULD CONTINUE TO TURN UNTIL OFF COMMAND IS TRANSMITTED. TRANSMIT SCAN ENABLE WOULD BE INHIBITED AND KU-BAND COMMUNICATION LOST.

DATE: 6/26/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: MECH/KBD FLIGHT: 2/1R MDAC ID: 4111 ABORT: 3/3

ITEM: GEAR TRAIN ASSEMBLY

FAILURE MODE: PHYSICAL BINDING/JAMMING, STRUCTURAL FAILURE,

FRACTURE

LEAD ANALYST: H.J. LOWERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND ANTENNA DEPLOYMENT SUBSYSTEM
- 3) DEPLOYMENT MECHANISM
- 4) ACTUATOR ASSEMBLY
- 5) GEAR TRAIN ASSEMBLY

6)

7)

8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	2/1R	ATO:	3/3
LANDING/SAFING:	•		•

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: KU-BAND ANTENNA PART NUMBER: MC287-0026-0002

CAUSES: CONTAMINATION, PIECE-PART FAILURE, STRUCTURAL FAILURE,

JAMMED, FRACTURE

EFFECTS/RATIONALE:

UNABLE TO STOW/DEPLOY ANTENNA.

DATE: 6/26/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: MECH/KBD

FLIGHT:

하하는 그들면 일을 살아 그들을 모르

2/1R

MDAC ID:

4112

ABORT:

3/3

ITEM:

GEAR TRAIN ASSEMBLY

FAILURE MODE: FAILS TO REMAIN IN POSITION, FREELY ROTATES

LEAD ANALYST: H.J. LOWERY

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND ANTENNA DEPLOYMENT SUBSYSTEM
- DEPLOYMENT MECHANISM 3)
- ACTUATOR ASSEMBLY 4)
- GEAR TRAIN ASSEMBLY 5)

6)

7)

8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	2/1R	ATO:	3/3
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION:

KU-BAND ANTENNA

PART NUMBER: MC287-0026-0002

CAUSES: MECHANICAL SHOCK, PIECE-PART FAILURE, STRUCTURAL

FAILURE, VIBRATION, OVERLOAD

EFFECTS/RATIONALE:

UNABLE TO STOW OR DEPLOY ANTENNA.

HIGHEST CRITICALITY HDW/FUNC DATE: 6/26/87 3/3 FLIGHT: SUBSYSTEM: MECH/KBD 3/3 ABORT: 4113 MDAC ID: ALL ITEMS NOT SHOWN ON MDAC ID 4101 - 4112 ITEM: FAILURE MODE: ALL FAILURE MODES SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM KU-BAND ANTENNA DEPLOYMENT SUBSYSTEM ALL REMAINING PARTS 3) 4) 5) 6) 7) 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE 3/3 RTLS: 3/3 PRELAUNCH: LIFTOFF: TAL: 3/3 3/3 AOA: 3/3 ONORBIT: 3/3 ATO: 3/3 DEORBIT: 3/3 LANDING/SAFING: 3/3

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: KU-BAND ANTENNA

PART NUMBER: ALL PARTS NOT SHOWN ON MDAC ID 4101 - 4112

CAUSES: ALL CAUSES

EFFECTS/RATIONALE:

FAILURE OF ALL PARTS NOT SHOWN ON MDAC ID 4101 - 4112 WILL HAVE NO EFFECT ON MISSION, VEHICLE OR CREW.

DATE: 8/14/87 SUBSYSTEM: MECH/KBD/EPD&C MDAC ID: 4500	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: /
ITEM: +28V CONTACT #1 FAILURE MODE: FAILS SHORTED	
LEAD ANALYST: A.D. MONTGOMERY	SUBSYS LEAD: H.J. LOWERY
BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) KU-BAND DEPLOY SUBSYSTEM 3) ELECTRICAL 4) DISPLAYS AND CONTROLS 5) SWITCHES 6) DIRECT STOW 7) ON POSITION 8) 9)	
CRITICAL	ITIES
FLIGHT PHASE HDW/FUNC PRELAUNCH: / LIFTOFF: / ONORBIT: 3/3 DEORBIT: / LANDING/SAFING: /	ABORT HDW/FUNC RTLS: / TAL: / AOA: / ATO: /
REDUNDANCY SCREENS: A []	B[] C[]
LOCATION: DISPLAY AND CONTROL PART NUMBER: KBS.DC.SW.DS.OP.CN1	ANEL R13A2
CAUSES: PIECE-PART STRUCTURAL FAIL	URE
EFFECTS/RATIONALE: NO EFFECT.	

DATE: 8/14/87 SUBSYSTEM: MECH/KBD/EPD&C MDAC ID: 4501 ITEM: +28V CONTACT #1 FAILURE MODE: FAILS OPEN	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: /
LEAD ANALYST: A.D. MONTGOMERY	SUBSYS LEAD: H.J. LOWERY
BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) KU-BAND DEPLOY SUBSYSTEM 3) ELECTRICAL 4) DISPLAYS AND CONTROLS 5) SWITCHES 6) DIRECT STOW 7) ON POSITION 8) 9)	
CRITICAI	TITIES
FLIGHT PHASE HDW/FUNC PRELAUNCH: / LIFTOFF: / ONORBIT: 3/3 DEORBIT: / LANDING/SAFING: /	
REDUNDANCY SCREENS: A []	B [] C []
LOCATION: DISPLAY AND CONTROL E PART NUMBER: KBS.DC.SW.DS.OP.CN1 CAUSES: PIECE-PART STRUCTURAL FAIR	
EFFECTS/RATIONALE: NO EFFECT.	

DATE: 8/14/87 SUBSYSTEM: MECH/KBD/EPD&C MDAC ID: 4502	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: /	
ITEM: +28V CONTACT #2 FAILURE MODE: FAILS SHORTED	en e	
LEAD ANALYST: A.D. MONTGOMERY	SUBSYS LEAD: H.J. LOWERY	
BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) KU-BAND DEPLOY SUBSYSTEM 3) ELECTRICAL 4) DISPLAYS AND CONTROLS 5) SWITCHES 6) DIRECT STOW 7) ON POSITION 8) 9)		
CRITICAL		
FLIGHT PHASE HDW/FUNC		
PRELAUNCH: / LIFTOFF: /	RTLS: / TAL: /	
ONORBIT: 3/3	AOA: /	
DEORBIT: /	ATO: /	
LANDING/SAFING: /		
REDUNDANCY SCREENS: A []	в[] с[]	
LOCATION: DISPLAY AND CONTROL PANEL R13A2 PART NUMBER: KBS.DC.SW.DS.OP.CN2		
CAUSES: PIECE-PART STRUCTURAL FAILURE		
EFFECTS/RATIONALE: NO EFFECT.		

DATE: 8/14/87 SUBSYSTEM: MECH/KBD/EPD&C MDAC ID: 4503	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: /
ITEM: +28V CONTACT #2 FAILURE MODE: FAILS OPEN	
LEAD ANALYST: A.D. MONTGOMERY	SUBSYS LEAD: H.J. LOWERY
BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) KU-BAND DEPLOY SUBSYSTEM 3) ELECTRICAL 4) DISPLAYS AND CONTROLS 5) SWITCHES 6) DIRECT STOW 7) ON POSITION 8) 9)	
CRITICAL	JITIES
FLIGHT PHASE HDW/FUNC PRELAUNCH: / LIFTOFF: / ONORBIT: 3/3 DEORBIT: / LANDING/SAFING: /	ABORT HDW/FUNC RTLS: / TAL: / AOA: / ATO: /
REDUNDANCY SCREENS: A []	B [] C []
LOCATION: DISPLAY AND CONTROL P PART NUMBER: KBS.DC.SW.DS.OP.CN2	ANEL R13A2
CAUSES: PIECE-PART STRUCTURAL FAIL	URE
EFFECTS/RATIONALE: NO EFFECT.	

DATE: 8/14/87 SUBSYSTEM: MECH/KBD/EPD&C MDAC ID: 4504	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: /
ITEM: +28V CONTACT #3 FAILURE MODE: FAILS SHORTED	
LEAD ANALYST: A.D. MONTGOMERY	SUBSYS LEAD: H.J. LOWERY
BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) KU-BAND DEPLOY SUBSYSTEM 3) ELECTRICAL 4) DISPLAYS AND CONTROLS 5) SWITCHES 6) DIRECT STOW 7) ON POSITION 8) 9)	
CRITICAL	TTTES
FLIGHT PHASE HDW/FUNC	ABORT HDW/FUNC
PRELAUNCH: /	RTLS: /
LIFTOFF: /	TAL: / AOA: /
ONORBIT: 3/3 DEORBIT: /	ATO: /
LANDING/SAFING: /	,
REDUNDANCY SCREENS: A []	в[] с[]
LOCATION: DISPLAY AND CONTROL PART NUMBER: KBS.DC.SW.DS.OP.CN3	ANEL R13A2
CAUSES: PIECE-PART STRUCTURAL FAILU	URE
EFFECTS/RATIONALE: NO EFFECT.	

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DATE: 8/14/87 SUBSYSTEM: MECH/KBD/EPD&C MDAC ID: 4505	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: /	
ITEM: +28V CONTACT #3 FAILURE MODE: FAILS OPEN		
LEAD ANALYST: A.D. MONTGOMERY	SUBSYS LEAD: H.J. LOWERY	
BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) KU-BAND DEPLOY SUBSYSTEM 3) ELECTRICAL 4) DISPLAYS AND CONTROLS 5) SWITCHES 6) DIRECT STOW 7) ON POSITION 8) 9)		
CRITICAL	ITIES	
FLIGHT PHASE HDW/FUNC	ABORT HDW/FUNC	
PRELAUNCH: /	RTLS: /	
LIFTOFF: /	TAL:	
ONORBIT: 3/3	AOA: / ATO: /	
DEORBIT: / LANDING/SAFING: /	ATO: /	
LANDING/BATING.	•	
REDUNDANCY SCREENS: A []	в[] С[]	
LOCATION: DISPLAY AND CONTROL PANEL R13A2 PART NUMBER: KBS.DC.SW.DS.OP.CN3		
CAUSES: PIECE-PART STRUCTURAL FAILURE		
EFFECTS/RATIONALE: NO EFFECT.		

DATE: 8/14/87 SUBSYSTEM: MECH/KBD/EPD&C MDAC ID: 4506	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: /
ITEM: +28V CONTACT #4 FAILURE MODE: FAILS SHORTED	
LEAD ANALYST: A.D. MONTGOMERY	SUBSYS LEAD: H.J. LOWERY
BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) KU-BAND DEPLOY SUBSYSTEM 3) ELECTRICAL 4) DISPLAYS AND CONTROLS 5) SWITCHES 6) DIRECT STOW 7) ON POSITION 8) 9)	
CRITICAL	ITIES
FLIGHT PHASE HDW/FUNC PRELAUNCH: / LIFTOFF: / ONORBIT: 3/3 DEORBIT: / LANDING/SAFING: /	ABORT HDW/FUNC RTLS: / TAL: / AOA: / ATO: /
REDUNDANCY SCREENS: A []	B[] C[]
LOCATION: DISPLAY AND CONTROL PART NUMBER: KBS.DC.SW.DS.OP.CN4	ANEL R13A2
CAUSES: PIECE-PART STRUCTURAL FAIL	URE
EFFECTS/RATIONALE: NO EFFECT.	
REFERENCES:	

DATE: 8/14/87 SUBSYSTEM: MECH/KBD/EPD&C MDAC ID: 4507 ITEM: +28V CONTACT #4 FAILURE MODE: FAILS OPEN	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: /
LEAD ANALYST: A.D. MONTGOMERY	SUBSYS LEAD: H.J. LOWERY
BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) KU-BAND DEPLOY SUBSYSTEM 3) ELECTRICAL 4) DISPLAYS AND CONTROLS 5) SWITCHES 6) DIRECT STOW 7) ON POSITION 8) 9)	
CRITICA	LITIES
	ABORT HDW/FUNC RTLS: / TAL: / AOA: / ATO: /
REDUNDANCY SCREENS: A []	в[] С[]
LOCATION: DISPLAY AND CONTROL OF THE PART NUMBER: KBS.DC.SW.DS.OP.CN4 CAUSES: PIECE-PART STRUCTURAL FAIR EFFECTS/RATIONALE:	
NO EFFECT.	

DATE: 8/14/87 HIGHEST CRITICALITY HDW/FUNC SUBSYSTEM: MECH/KBD/EPD&C FLIGHT: 3/2R MDAC ID: 4508 ABORT: /

ITEM: +28V CONTACT #1 FAILURE MODE: FAILS SHORTED

SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

1) MECHANICAL ACTUATION SYSTEM

LEAD ANALYST: A.D. MONTGOMERY

- 2) KU-BAND DEPLOY SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAYS AND CONTROLS
- 5) SWITCHES
- 6) DIRECT STOW
- 7) OFF POSITION

8) 9)

CRITICALITIES

FLIGHT PHASE HDW/FUNC ABORT HDW/FUNC PRELAUNCH: / RTLS: / LIFTOFF: / TAL: / ONORBIT: 3/2R AOA: / DEORBIT: / ATO: / LANDING/SAFING: /

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: DISPLAY AND CONTROL PANEL R13A2

PART NUMBER: KBS.DC.SW.DS.OFP.CN1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD CAUSE UNCOMMANDED STOWAGE OF THE ANTENNA.

HIGHEST CRITICALITY HDW/FUNC 8/14/87 DATE: 3/1R FLIGHT: SUBSYSTEM: MECH/KBD/EPD&C ABORT: MDAC ID: 4509 +28V CONTACT #1 ITEM: FAILURE MODE: FAILS OPEN SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: A.D. MONTGOMERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM KU-BAND DEPLOY SUBSYSTEM 2) ELECTRICAL DISPLAYS AND CONTROLS 4) SWITCHES DIRECT STOW 6) OFF POSITION 7) 8) 9) CRITICALITIES HDW/FUNC HDW/FUNC ABORT FLIGHT PHASE RTLS: PRELAUNCH: TAL: LIFTOFF: 3/1R AOA: ONORBIT: ATO: DEORBIT: LANDING/SAFING: A[2] B[F] C[P] REDUNDANCY SCREENS: DISPLAY AND CONTROL PANEL R13A2 LOCATION: PART NUMBER: KBS.DC.SW.DS.OFP.CN1 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT STOWAGE OF THE ANTENNA.

8/14/87 HIGHEST CRITICALITY HDW/FUNC DATE: SUBSYSTEM: MECH/KBD/EPD&C FLIGHT: 3/2R ABORT: MDAC ID: 4510 ITEM: +28V CONTACT #2 FAILURE MODE: FAILS SHORTED LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM KU-BAND DEPLOY SUBSYSTEM 2) 3) ELECTRICAL DISPLAYS AND CONTROLS 4) SWITCHES 5) DIRECT STOW 7) OFF POSITION 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE RTLS: TAL: / PRELAUNCH: LIFTOFF: 3/2R AOA: ONORBIT: / ATO: DEORBIT: LANDING/SAFING: REDUNDANCY SCREENS: A [2] B [F] C [P] LOCATION: DISPLAY AND CONTROL PANEL R13A2 PART NUMBER: KBS.DC.SW.DS.OFP.CN2 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD CAUSE UNCOMMANDED

· Litting the week

REFERENCES:

STOWAGE OF THE ANTENNA.

HIGHEST CRITICALITY HDW/FUNC DATE: 8/14/87 3/1R FLIGHT: SUBSYSTEM: MECH/KBD/EPD&C ABORT: MDAC ID: 4511 +28V CONTACT #2 ITEM: FAILURE MODE: FAILS OPEN SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: A.D. MONTGOMERY BREAKDOWN HIERARCHY: MECHANICAL ACTUATION SYSTEM KU-BAND DEPLOY SUBSYSTEM 2) ELECTRICAL 3) DISPLAYS AND CONTROLS 4) SWITCHES DIRECT STOW 6) OFF POSITION 7) 8) 9) CRITICALITIES ABORT HDW/FUNC FLIGHT PHASE HDW/FUNC RTLS: PRELAUNCH: TAL: LIFTOFF: AOA: 3/1R ONORBIT: ATO: DEORBIT: LANDING/SAFING: A [2] B [F] C [P] REDUNDANCY SCREENS: DISPLAY AND CONTROL PANEL R13A2 LOCATION: PART NUMBER: KBS.DC.SW.DS.OFP.CN2 CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT STOWAGE

OF THE ANTENNA.

HIGHEST CRITICALITY HDW/FUNC DATE: 8/14/87 SUBSYSTEM: MECH/KBD/EPD&C FLIGHT: 3/2R MDAC ID: 4512 ABORT: / ITEM: +28V CONTACT #3 FAILURE MODE: FAILS SHORTED LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM KU-BAND DEPLOY SUBSYSTEM 2) 3) ELECTRICAL 4) DISPLAYS AND CONTROLS SWITCHES DIRECT STOW 6) 7) OFF POSITION 8)

CRITICALITIES

HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE RTLS: TAL: / ----/ PRELAUNCH: LIFTOFF: 3/2R AOA: ONORBIT: ATO: DEORBIT: LANDING/SAFING:

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: DISPLAY AND CONTROL PANEL R13A2

PART NUMBER: KBS.DC.SW.DS.OFP.CN3

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD CAUSE UNCOMMANDED STOWAGE OF THE ANTENNA.

REFERENCES:

9)

HIGHEST CRITICALITY HDW/FUNC DATE: 8/14/87 FLIGHT: 3/1R SUBSYSTEM: MECH/KBD/EPD&C ABORT: MDAC ID: 4513 +28V CONTACT #3 ITEM: FAILURE MODE: FAILS OPEN SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: A.D. MONTGOMERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM KU-BAND DEPLOY SUBSYSTEM 2) ELECTRICAL 3) DISPLAYS AND CONTROLS 4) SWITCHES 5) 6) DIRECT STOW 7) OFF POSITION 8) 9) CRITICALITIES FLIGHT PHASE ABORT HDW/FUNC HDW/FUNC RTLS: PRELAUNCH: TAL: LIFTOFF: 3/1R AOA: ONORBIT: ATO: DEORBIT: LANDING/SAFING: REDUNDANCY SCREENS: A [2] B [F] C [P] DISPLAY AND CONTROL PANEL R13A2 LOCATION: PART NUMBER: KBS.DC.SW.DS.OFP.CN3 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT STOWAGE

REFERENCES:

OF THE ANTENNA.

DATE: 8/14/87 HIGHEST CRITICALITY HDW/FUNC SUBSYSTEM: MECH/KBD/EPD&C FI.TCHT. ABORT: MDAC ID: 4514 ITEM: +28V CONTACT #4 FAILURE MODE: FAILS SHORTED LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM KU-BAND DEPLOY SUBSYSTEM 3) ELECTRICAL 4) DISPLAYS AND CONTROLS SWITCHES DIRECT STOW OFF POSITION 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC
/ RTLS: /
TAL: /
3/2R AOA: / FLIGHT PHASE PRELAUNCH: PRELAUNCH: /
LIFTOFF: /
ONORBIT: 3/2R
DEORBIT: / ATO: DEORBIT: /
LANDING/SAFING: / REDUNDANCY SCREENS: A [2] B [F] C [P] LOCATION: DISPLAY AND CONTROL PANEL R13A2 PART NUMBER: KBS.DC.SW.DS.OFP.CN4 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD CAUSE UNCOMMAND STOWAGE OF THE ANTENNA.

HIGHEST CRITICALITY HDW/FUNC DATE: 8/14/87 3/1R FLIGHT: SUBSYSTEM: MECH/KBD/EPD&C ABORT: 4515 MDAC ID: +28V CONTACT #4 ITEM: FAILURE MODE: FAILS OPEN SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: A.D. MONTGOMERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM KU-BAND DEPLOY SUBSYSTEM 2) ELECTRICAL 3) DISPLAYS AND CONTROLS 4) SWITCHES DIRECT STOW 6) 7) OFF POSITION 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE RTLS: PRELAUNCH: LIFTOFF: TAL: 3/1R AOA: ONORBIT: ATO: DEORBIT: LANDING/SAFING: B[F] C[P] REDUNDANCY SCREENS: A [2] DISPLAY AND CONTROL PANEL R13A2 LOCATION: PART NUMBER: KBS.DC.SW.DS.OFP.CN4 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT STOWAGE

REFERENCES:

OF THE ANTENNA.

DATE: 8/14/87 HIGHEST CRITICALITY HDW/FUNC SUBSYSTEM: MECH/KBD/EPD&C FLIGHT: 3/1R MDAC ID: 4516 ABORT: /

ITEM: +28V CONTACT #1
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND DEPLOY SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAYS AND CONTROLS
- 5) SWITCHES
- 6) DEPLOY/GROUND/STOW
- 7) DEPLOY POSITION

8) 9)

CRITICALITIES

FLIGHT PHASE HDW/FUNC ABORT HDW/FUNC PRELAUNCH: / RTLS: / LIFTOFF: / TAL: / ONORBIT: 3/1R AOA: / DEORBIT: / ATO: / LANDING/SAFING: /

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: DISPLAY AND CONTROL PANEL R13A2

PART NUMBER: KBS.DC.SW.DGS.DP.CN1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD CAUSE UNCOMMANDED DEPLOYMENT OF THE ANTENNA.

HIGHEST CRITICALITY HDW/FUNC 8/14/87 DATE: 3/2R FLIGHT: SUBSYSTEM: MECH/KBD/EPD&C ABORT: MDAC ID: 4517 +28V CONTACT #1 ITEM: FAILURE MODE: FAILS OPEN LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: MECHANICAL ACTUATION SYSTEM 1) KU-BAND DEPLOY SUBSYSTEM 2) 3) ELECTRICAL DISPLAYS AND CONTROLS 4) SWITCHES 5) DEPLOY/GROUND/STOW 6) DEPLOY POSITION 7) 8) 9) CRITICALITIES ABORT HDW/FUNC HDW/FUNC FLIGHT PHASE RTLS: PRELAUNCH: TAL: LIFTOFF: 3/2R AOA: ONORBIT: ATO: DEORBIT: LANDING/SAFING: B[F] C[P] A [2] REDUNDANCY SCREENS: DISPLAY AND CONTROL PANEL R13A2 LOCATION: PART NUMBER: KBS.DC.SW.DGS.DP.CN1 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE:

REFERENCES:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT

DEPLOYMENT OF THE ANTENNA.

DATE: 8/14/87 HIGHEST CRITICALITY HDW/FUNC SUBSYSTEM: MECH/KBD/EPD&C FLIGHT: 3/1R

MDAC ID: 4518 ABORT: /

ITEM: +28V CONTACT #2
FAILURE MODE: FAILS SHORTED

LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) KU-BAND DEPLOY SUBSYSTEM
- 3) ELECTRICAL
- 4) DISPLAYS AND CONTROLS
- 5) SWITCHES
- 6) DEPLOY/GROUND/STOW
- 7) DEPLOY POSITION

8) 9)

CRITICALITIES

FLIGHT PHASE HDW/FUNC ABORT HDW/FUNC PRELAUNCH: / RTLS: / LIFTOFF: / TAL: / ONORBIT: 3/1R AOA: / DEORBIT: / ATO: / LANDING/SAFING: /

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: DISPLAY AND CONTROL PANEL R13A2

PART NUMBER: KBS.DC.SW.DGS.DP.CN2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD CAUSE UNCOMMANDED DEPLOYMENT OF THE ANTENNA.

HIGHEST CRITICALITY HDW/FUNC 8/14/87 DATE: 3/2R FLIGHT: SUBSYSTEM: MECH/KBD/EPD&C ABORT: 4519 MDAC ID: +28V CONTACT #2 ITEM: FAILURE MODE: FAILS OPEN SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: A.D. MONTGOMERY BREAKDOWN HIERARCHY: MECHANICAL ACTUATION SYSTEM KU-BAND DEPLOY SUBSYSTEM 2) 3) ELECTRICAL DISPLAYS AND CONTROLS 4) **SWITCHES** 5) DEPLOY/GROUND/STOW 6) DEPLOY POSITION 7) 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE RTLS: PRELAUNCH: TAL: LIFTOFF: 3/2R ONORBIT: AOA: ATO: DEORBIT: LANDING/SAFING: REDUNDANCY SCREENS: A [2] B [F] C [P] DISPLAY AND CONTROL PANEL R13A2 LOCATION: PART NUMBER: KBS.DC.SW.DGS.DP.CN2 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE:

REFERENCES:

DEPLOYMENT OF THE ANTENNA.

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT

HIGHEST CRITICALITY HDW/FUNC 8/14/87 DATE: SUBSYSTEM: MECH/KBD/EPD&C FLIGHT: 3/1R ABORT: MDAC ID: 4520 ITEM: +28V CONTACT #3 FAILURE MODE: FAILS SHORTED LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM KU-BAND DEPLOY SUBSYSTEM 3) ELECTRICAL DISPLAYS AND CONTROLS 4) 5) SWITCHES 6) DEPLOY/GROUND/STOW 7) DEPLOY POSITION 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE , PRELAUNCH: RTLS: LIFTOFF: TAL: 3/1R AOA: ONORBIT: ATO: DEORBIT: LANDING/SAFING: REDUNDANCY SCREENS: A [2] B [F] C [P] LOCATION: DISPLAY AND CONTROL PANEL R13A2 PART NUMBER: KBS.DC.SW.DGS.DP.CN3 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD CAUSE UNCOMMANDED DEPLOYMENT OF THE ANTENNA.

HIGHEST CRITICALITY HDW/FUNC 8/14/87 DATE: 3/2R FLIGHT: SUBSYSTEM: MECH/KBD/EPD&C ABORT: MDAC ID: 4521 +28V CONTACT #3 ITEM: FAILURE MODE: FAILS OPEN LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) KU-BAND DEPLOY SUBSYSTEM ELECTRICAL 3) DISPLAYS AND CONTROLS 4) **SWITCHES** 5) DEPLOY/GROUND/STOW DEPLOY POSITION 7) 8) 9) CRITICALITIES ABORT HDW/FUNC FLIGHT PHASE HDW/FUNC / RTLS: PRELAUNCH: TAL: LIFTOFF: 3/2R AOA: ONORBIT: ATO: DEORBIT: / LANDING/SAFING: REDUNDANCY SCREENS: A [2] B [F] C [P] DISPLAY AND CONTROL PANEL R13A2 LOCATION: PART NUMBER: KBS.DC.SW.DGS.DP.CN3 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE:

REFERENCES:

DEPLOYMENT OF THE ANTENNA.

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT

HIGHEST CRITICALITY HDW/FUNC DATE: 8/14/87 SUBSYSTEM: MECH/KBD/EPD&C FLIGHT: 3/1R ABORT: MDAC ID: 4522 / ITEM: +28V CONTACT #4 FAILURE MODE: FAILS SHORTED LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) KU-BAND DEPLOY SUBSYSTEM ELECTRICAL 3) 4) DISPLAYS AND CONTROLS 5) **SWITCHES** DEPLOY/GROUND/STOW 6) DEPLOY POSITION 7) 8) 9) CRITICALITIES FLIGHT PHASE HDW/FUNC ABORT HDW/FUNC RTLS: / PRELAUNCH: TAL: LIFTOFF: 3/1R AOA: ONORBIT: DEORBIT: ATO: LANDING/SAFING:

LOCATION: DISPLAY AND CONTROL PANEL R13A2

REDUNDANCY SCREENS: A [2] B [F] C [P]

PART NUMBER: KBS.DC.SW.DGS.DP.CN4

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD CAUSE UNCOMMANDED DEPLOYMENT OF THE ANTENNA.

HIGHEST CRITICALITY HDW/FUNC 8/14/87 DATE: 3/2R FLIGHT: SUBSYSTEM: MECH/KBD/EPD&C ABORT: MDAC ID: 4523 +28V CONTACT #4 ITEM: FAILURE MODE: FAILS OPEN SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: A.D. MONTGOMERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM KU-BAND DEPLOY SUBSYSTEM 2) 3) ELECTRICAL 4) DISPLAYS AND CONTROLS SWITCHES 5) DEPLOY/GROUND/STOW 6) DEPLOY POSITION 7) 8) 9) CRITICALITIES FLIGHT PHASE HDW/FUNC ABORT HDW/FUNC PRELAUNCH: RTLS: / TAL: LIFTOFF: 3/2R AOA: ONORBIT: ATO: DEORBIT: LANDING/SAFING: REDUNDANCY SCREENS: A [2] B[F] C[P] DISPLAY AND CONTROL PANEL R13A2 LOCATION: PART NUMBER: KBS.DC.SW.DGS.DP.CN4 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT

REFERENCES:

DEPLOYMENT OF THE ANTENNA.

DATE: 8/14/87 SUBSYSTEM: MECH/KBD/EPD MDAC ID: 4524	&C		ITICALITY FLIGHT: ABORT:	HDW/FUNC 3/3 /
ITEM: +28V CONT FAILURE MODE: FAILS SHO				
LEAD ANALYST: A.D. MONTG	OMERY	SUBSYS LEAD): H.J. LO	WERY
BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATIO 2) KU-BAND DEPLOY SUBS 3) ELECTRICAL 4) DISPLAYS AND CONTRO 5) SWITCHES 6) DEPLOY/GROUND/STOW 7) GROUND POSITION 8) 9)	YSTEM			
	CRITICAL	ITIES		
PRELAUNCH: LIFTOFF:	W/FUNC / 3/3 /	ABORT RTLS: TAL: AOA: ATO:	HDW/FUN / / /	· .
REDUNDANCY SCREENS: A	[] I	3 []	c []	
LOCATION: DISPLAY AN PART NUMBER: KBS.DC.SW.		ANEL R13A2		
CAUSES: PIECE-PART STRU	CTURAL FAILU	JRE		
EFFECTS/RATIONALE: NO EFFECT.				
REFERENCES:				

HIGHEST CRITICALITY HDW/FUNC 8/14/87 DATE: 3/2R SUBSYSTEM: MECH/KBD/EPD&C FLIGHT: ABORT: 4525 MDAC ID: +28V CONTACT #1 ITEM: FAILURE MODE: FAILS OPEN SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: A.D. MONTGOMERY BREAKDOWN HIERARCHY: MECHANICAL ACTUATION SYSTEM KU-BAND DEPLOY SUBSYSTEM 2) 3) ELECTRICAL DISPLAYS AND CONTROLS 4) SWITCHES 5) 6) DEPLOY/GROUND/STOW GROUND POSITION 7) 8) 9) CRITICALITIES HDW/FUNC ABORT FLIGHT PHASE HDW/FUNC RTLS: PRELAUNCH: TAL: LIFTOFF: 3/2R AOA: ONORBIT: ATO: DEORBIT: LANDING/SAFING: C [P] B [F] REDUNDANCY SCREENS: A [2] DISPLAY AND CONTROL PANEL R13A2 LOCATION:

PART NUMBER: KBS.DC.SW.DGS.GP.CN1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT

DEPLOYMENT OF THE ANTENNA.

DATE: 8/14/8° SUBSYSTEM: MECH/KBD, MDAC ID: 4526		TICALITY LIGHT: ABORT:	HDW/FUNC 3/3 /	
ITEM: +28V (FAILURE MODE: FAILS				4 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -
LEAD ANALYST: A.D. MO	ONTGOMERY	SUBSYS LEAD): H.J. LO	WERY
BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUAL 2) KU-BAND DEPLOY S 3) ELECTRICAL 4) DISPLAYS AND COM 5) SWITCHES 6) DEPLOY/GROUND/ST 7) GROUND POSITION 8) 9)	SUBSYSTEM NTROLS			
	CRITICAL	TTES		
FLIGHT PHASE PRELAUNCH: LIFTOFF: ONORBIT: DEORBIT: LANDING/SAFING	HDW/FUNC / 3/3	ABORT RTLS: TAL: AOA: ATO:	HDW/FUNG / / /	3
REDUNDANCY SCREENS:	A [] F	3 []	c []	
LOCATION: DISPLAY PART NUMBER: KBS.DC.		ANEL R13A2		
CAUSES: PIECE-PART S	TRUCTURAL FAILU	JRE		
EFFECTS/RATIONALE: NO EFFECT.	t tat			

HIGHEST CRITICALITY HDW/FUNC 8/14/87 DATE: 3/2R FLIGHT: SUBSYSTEM: MECH/KBD/EPD&C ABORT: MDAC ID: 4527 +28V CONTACT #2 ITEM: FAILURE MODE: FAILS OPEN SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: A.D. MONTGOMERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM KU-BAND DEPLOY SUBSYSTEM 2) ELECTRICAL 3) DISPLAYS AND CONTROLS 4) **SWITCHES** 5) DEPLOY/GROUND/STOW 6) 7) GROUND POSITION 8) 9) CRITICALITIES ABORT FLIGHT PHASE HDW/FUNC HDW/FUNC RTLS: PRELAUNCH: / TAL: LIFTOFF: 3/2R AOA: ONORBIT: ATO: / DEORBIT: LANDING/SAFING: REDUNDANCY SCREENS: A [2] B [F] C [P] DISPLAY AND CONTROL PANEL R13A2 LOCATION: PART NUMBER: KBS.DC.SW.DGS.GP.CN2 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT

REFERENCES:

DEPLOYMENT OF THE ANTENNA.

DATE: 8/14/87 SUBSYSTEM: MECH/KBD/EPD&C MDAC ID: 4528	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT:
ITEM: +28V CONTACT #3 FAILURE MODE: FAILS SHORTED	14 - 四四四四四 - 1 阿爾明 - 2四月 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -
LEAD ANALYST: A.D. MONTGOMERY	SUBSYS LEAD: H.J. LOWERY
BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) KU-BAND DEPLOY SUBSYSTEM 3) ELECTRICAL 4) DISPLAYS AND CONTROLS 5) SWITCHES 6) DEPLOY/GROUND/STOW 7) GROUND POSITION 8) 9)	
CRITIC	CALITIES
FLIGHT PHASE HDW/FUNC PRELAUNCH: / LIFTOFF: / ONORBIT: 3/3 DEORBIT: / LANDING/SAFING: /	
REDUNDANCY SCREENS: A []	B [] C []
LOCATION: DISPLAY AND CONTROL PART NUMBER: KBS.DC.SW.DGS.GP.CN	
CAUSES: PIECE-PART STRUCTURAL FA	ILURE
EFFECTS/RATIONALE: NO EFFECT.	en een die verschap van
REFERENCES:	

HIGHEST CRITICALITY HDW/FUNC 8/14/87 DATE: FLIGHT: 3/2R SUBSYSTEM: MECH/KBD/EPD&C ABORT: / MDAC ID: 4529 +28V CONTACT #3 ITEM: FAILURE MODE: FAILS OPEN LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: MECHANICAL ACTUATION SYSTEM 1) KU-BAND DEPLOY SUBSYSTEM 2) ELECTRICAL 3) DISPLAYS AND CONTROLS 4) **SWITCHES** 5) DEPLOY/GROUND/STOW 6) GROUND POSITION 7) 8) 9) CRITICALITIES ABORT HDW/FUNC FLIGHT PHASE HDW/FUNC RTLS: PRELAUNCH: / TAL: LIFTOFF: 3/2R AOA: ONORBIT: ATO: DEORBIT: LANDING/SAFING:

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: DISPLAY AND CONTROL PANEL R13A2 PART NUMBER: KBS.DC.SW.DGS.GP.CN3

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT

DEPLOYMENT OF THE ANTENNA.

DATE: 8/14/87 SUBSYSTEM: MECH/KBD/EPD&C MDAC ID: 4530	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: /
ITEM: +28V CONTACT #4 FAILURE MODE: FAILS SHORTED	
LEAD ANALYST: A.D. MONTGOMERY	SUBSYS LEAD: H.J. LOWERY
BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) KU-BAND DEPLOY SUBSYSTEM 3) ELECTRICAL 4) DISPLAYS AND CONTROLS 5) SWITCHES 6) DEPLOY/GROUND/STOW 7) GROUND POSITION 8) 9)	
CRITICALI	TIES
FLIGHT PHASE HDW/FUNC PRELAUNCH: / LIFTOFF: / ONORBIT: 3/3 DEORBIT: / LANDING/SAFING: /	ABORT HDW/FUNC RTLS: / TAL: / AOA: / ATO: /
REDUNDANCY SCREENS: A [] B	s[] c[]
LOCATION: DISPLAY AND CONTROL PA PART NUMBER: KBS.DC.SW.DGS.GP.CN4	NEL R13A2
CAUSES: PIECE-PART STRUCTURAL FAILU	RE
EFFECTS/RATIONALE: NO EFFECT.	
REFERENCES:	

HIGHEST CRITICALITY HDW/FUNC 8/14/87 DATE: FLIGHT: 3/2R SUBSYSTEM: MECH/KBD/EPD&C ABORT: MDAC ID: 4531 +28V CONTACT #4 ITEM: FAILURE MODE: FAILS OPEN LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: MECHANICAL ACTUATION SYSTEM KU-BAND DEPLOY SUBSYSTEM 2) ELECTRICAL 3) DISPLAYS AND CONTROLS 4) SWITCHES 5) DEPLOY/GROUND/STOW 6) 7) GROUND POSITION 8) 9) CRITICALITIES HDW/FUNC HDW/FUNC ABORT FLIGHT PHASE RTLS: PRELAUNCH: TAL: LIFTOFF: AOA: ONORBIT: 3/2R ATO: DEORBIT: LANDING/SAFING: A[2] B[F] C[P] REDUNDANCY SCREENS: DISPLAY AND CONTROL PANEL R13A2 LOCATION: PART NUMBER: KBS.DC.SW.DGS.GP.CN4 CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT

DEPLOYMENT OF THE ANTENNA.

8/14/87 HIGHEST CRITICALITY HDW/FUNC DATE: SUBSYSTEM: MECH/KBD/EPD&C FLIGHT: 3/2R MDAC ID: 4532 ABORT: / . +28V CONTACT #1 ITEM: FAILURE MODE: FAILS SHORTED LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: MECHANICAL ACTUATION SYSTEM 2) KU-BAND DEPLOY SUBSYSTEM 3) ELECTRICAL DISPLAYS AND CONTROLS 4) 5) **SWITCHES** 6) DEPLOY/GROUND/STOW 7) STOW POSITION 8) 9) CRITICALITIES HDW/FUNC ABORT FLIGHT PHASE HDW/FUNC / PRELAUNCH: RTLS: LIFTOFF: TAL: 3/2R ONORBIT: AOA: ATO: DEORBIT: / LANDING/SAFING: REDUNDANCY SCREENS: A [2] B [F] C [P] DISPLAY AND CONTROL PANEL R13A2 LOCATION: PART NUMBER: KBS.DC.SW.DGS.SP.CN1 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT DEPLOYMENT OF THE ANTENNA.

HDW/FUNC HIGHEST CRITICALITY 8/14/87 DATE: 3/1R FLIGHT: SUBSYSTEM: MECH/KBD/EPD&C ABORT: MDAC ID: 4533 +28V CONTACT #1 ITEM: FAILURE MODE: FAILS OPEN SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: A.D. MONTGOMERY BREAKDOWN HIERARCHY: MECHANICAL ACTUATION SYSTEM KU-BAND DEPLOY SUBSYSTEM 2) ELECTRICAL 3) DISPLAYS AND CONTROLS 4) **SWITCHES** 5) DEPLOY/GROUND/STOW 6) 7) STOW POSITION 8) 9) CRITICALITIES FLIGHT PHASE ABORT HDW/FUNC HDW/FUNC RTLS: PRELAUNCH: TAL: LIFTOFF: AOA: 3/1R ONORBIT: ATO: DEORBIT: LANDING/SAFING: REDUNDANCY SCREENS: A [2] B [F] C [P] DISPLAY AND CONTROL PANEL R13A2 LOCATION: KBS.DC.SW.DGS.SP.CN1 PART NUMBER: CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT STOWAGE OF THE ANTENNA.

HIGHEST CRITICALITY HDW/FUNC DATE: 8/14/87 SUBSYSTEM: MECH/KBD/EPD&C FLIGHT: 3/2R ABORT: MDAC ID: 4534 +28V CONTACT #2 ITEM: ... · 🛎 🖫 🖦 FAILURE MODE: FAILS SHORTED LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: MECHANICAL ACTUATION SYSTEM 1) 2) KU-BAND DEPLOY SUBSYSTEM 3) ELECTRICAL DISPLAYS AND CONTROLS 4) SWITCHES 5) DEPLOY/GROUND/STOW 6) STOW POSITION 7) 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE PRELAUNCH: / RTLS: / LIFTOFF: TAL: 3/2R AOA: ONORBIT: / ATO: DEORBIT: LANDING/SAFING: / REDUNDANCY SCREENS: A [2] B [F] C [P] LOCATION: DISPLAY AND CONTROL PANEL R13A2 PART NUMBER: KBS.DC.SW.DGS.SP.CN2 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT DEPLOYMENT OF THE ANTENNA.

HIGHEST CRITICALITY HDW/FUNC 8/14/87 DATE: 3/1R FLIGHT: SUBSYSTEM: MECH/KBD/EPD&C ABORT: MDAC ID: 4535 +28V CONTACT #2 ITEM: FAILURE MODE: FAILS OPEN SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: A.D. MONTGOMERY BREAKDOWN HIERARCHY: MECHANICAL ACTUATION SYSTEM 1) KU-BAND DEPLOY SUBSYSTEM 2) ELECTRICAL 3) DISPLAYS AND CONTROLS 4) **SWITCHES** 5) DEPLOY/GROUND/STOW 6) STOW POSITION 7) 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE RTLS: PRELAUNCH: TAL: LIFTOFF: 3/1R AOA: ONORBIT: ATO: / DEORBIT: LANDING/SAFING: REDUNDANCY SCREENS: A [2] B [F] C [P] DISPLAY AND CONTROL PANEL R13A2 LOCATION: PART NUMBER: KBS.DC.SW.DGS.SP.CN2 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT STOWAGE OF THE ANTENNA.

HIGHEST CRITICALITY HDW/FUNC DATE: 8/14/87 3/2R SUBSYSTEM: MECH/KBD/EPD&C FLIGHT: MDAC ID: 4536 ABORT: ITEM: +28V CONTACT #3 FAILURE MODE: FAILS SHORTED LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: MECHANICAL ACTUATION SYSTEM 2) KU-BAND DEPLOY SUBSYSTEM 3) ELECTRICAL DISPLAYS AND CONTROLS 4) SWITCHES DEPLOY/GROUND/STOW 6) 7) STOW POSITION 8) 9) CRITICALITIES FLIGHT PHASE HDW/FUNC ABORT HDW/FUNC PRELAUNCH: RTLS: / TAL: LIFTOFF: 3/2R AOA: ONORBIT: DEORBIT: ATO: LANDING/SAFING: REDUNDANCY SCREENS: A [2] B [F] C [P] LOCATION: DISPLAY AND CONTROL PANEL R13A2 PART NUMBER: KBS.DC.SW.DGS.SP.CN3 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT DEPLOYMENT OF THE ANTENNA.

HDW/FUNC HIGHEST CRITICALITY 8/14/87 DATE: 3/1R SUBSYSTEM: MECH/KBD/EPD&C FLIGHT: ABORT: MDAC ID: 4537 +28V CONTACT #3 ITEM: FAILURE MODE: FAILS OPEN SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: A.D. MONTGOMERY BREAKDOWN HIERARCHY: MECHANICAL ACTUATION SYSTEM 1) KU-BAND DEPLOY SUBSYSTEM 2) ELECTRICAL 3) DISPLAYS AND CONTROLS 4) SWITCHES 5) DEPLOY/GROUND/STOW 6) STOW POSITION 7) 8) 9) CRITICALITIES HDW/FUNC FLIGHT PHASE HDW/FUNC ABORT RTLS: PRELAUNCH: LIFTOFF: TAL: 3/1R AOA: ONORBIT: ATO: DEORBIT: LANDING/SAFING: C [P] A [2] B [F] REDUNDANCY SCREENS: DISPLAY AND CONTROL PANEL R13A2 LOCATION: PART NUMBER: KBS.DC.SW.DGS.SP.CN3 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT STOWAGE OF THE ANTENNA.

HIGHEST CRITICALITY HDW/FUNC 8/14/87 DATE: SUBSYSTEM: MECH/KBD/EPD&C FLIGHT: 3/2R ABORT: MDAC ID: 4538 ITEM: +28V CONTACT #4
FAILURE MODE: FAILS SHORTED LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM KU-BAND DEPLOY SUBSYSTEM 3) ELECTRICAL 4) DISPLAYS AND CONTROLS SWITCHES 6) DEPLOY/GROUND/STOW 7) STOW POSITION 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC
/ RTLS: /
TAL: /
3/2R AOA: /
ATO: / FLIGHT PHASE PRELAUNCH: LIFTOFF: ONORBIT: DEORBIT: DEORBIT: /
LANDING/SAFING: / REDUNDANCY SCREENS: A [2] B[F] C[P] LOCATION: DISPLAY AND CONTROL PANEL R13A2 PART NUMBER: KBS.DC.SW.DGS.SP.CN4 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT DEPLOYMENT OF THE ANTENNA.

HDW/FUNC HIGHEST CRITICALITY DATE: 8/14/87 FLIGHT: 3/1R SUBSYSTEM: MECH/KBD/EPD&C ABORT: MDAC ID: 4539 +28V CONTACT #4 ITEM: FAILURE MODE: FAILS OPEN SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: A.D. MONTGOMERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM KU-BAND DEPLOY SUBSYSTEM 2) 3) ELECTRICAL DISPLAYS AND CONTROLS 4) **SWITCHES** 5) DEPLOY/GROUND/STOW 6) 7) STOW POSITION 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE RTLS: PRELAUNCH: TAL: LIFTOFF: 3/1R AOA: ONORBIT: ATO: DEORBIT: LANDING/SAFING: B [F] C [P] REDUNDANCY SCREENS: A [2] DISPLAY AND CONTROL PANEL R13A2 LOCATION: PART NUMBER: KBS.DC.SW.DGS.SP.CN4 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT STOWAGE

REFERENCES:

OF THE ANTENNA.

DATE: 8/14/87 SUBSYSTEM: MECH/KBD/EPD&C MDAC ID: 4540	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: /
ITEM: TALKBACK FAILURE MODE: FAILS TO DEPLOY	
LEAD ANALYST: A.D. MONTGOMERY	SUBSYS LEAD: H.J. LOWERY
BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) KU-BAND DEPLOY SUBSYSTEM 3) ELECTRICAL 4) DISPLAYS AND CONTROLS 5) SWITCHES 6) DEPLOY/GROUND/STOW 7) 8) 9)	
CRITICAL	ITIES
FLIGHT PHASE HDW/FUNC PRELAUNCH: / LIFTOFF: / ONORBIT: 3/3 DEORBIT: / LANDING/SAFING: /	ABORT HDW/FUNC RTLS: / TAL: / AOA: / ATO: /
REDUNDANCY SCREENS: A []	B[] C[]
LOCATION: DISPLAY AND CONTROL P. PART NUMBER: KBS.DC.SW.DGS.TB	ANEL R13A2
CAUSES: PIECE-PART STRUCTURAL FAIL	URE
EFFECTS/RATIONALE: TALKBACK MAY NOT SHOW CORRECT STATU	S
REFERENCES:	

DATE: 8/14/87 SUBSYSTEM: MECH/KBD/EPD&C MDAC ID: 4541	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: /				
ITEM: TALKBACK FAILURE MODE: FAILS TO BARBERPOLE					
LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY					
BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) KU-BAND DEPLOY SUBSYSTEM 3) ELECTRICAL 4) DISPLAYS AND CONTROLS 5) SWITCHES 6) DEPLOY/GROUND/STOW 7) 8)					
CRITICAL	ITIES				
FLIGHT PHASE HDW/FUNC PRELAUNCH: LIFTOFF: ONORBIT: 3/3 DEORBIT: LANDING/SAFING:					
REDUNDANCY SCREENS: A []	B [] C []				
LOCATION: DISPLAY AND CONTROL P PART NUMBER: KBS.DC.SW.DGS.TB	ANEL R13A2				
CAUSES: PIECE-PART STRUCTURAL FAIL	URE				
EFFECTS/RATIONALE: TALKBACK MAY NOT SHOW CORRECT STATU	S.				

SUBS		8/14/87 MECH/KBD/ 4542			HIGH	IEST	FL	ICALI IGHT: ORT:	;	HDW/FUNC 3/3 /
	: URE MOD	TALKBA	ACK TO STOW		·.		n e jeves	+ 45 ¥		
LEAD	ANALYS'	r: A.D. M	ONTGOMERY	?	SUBS	YS I	LEAD:	н.ј.	LOW	ERY
1) 2) 3)	MECHAN KU-BAN ELECTR	ys and com	SUBSYSTEM		······································		•			- -
		/GROUND/ST	WOJ							
		`	CF	RITICAL	ITIES	}		-		
	PREL LIFT ONOR: DEOR:	AUNCH: OFF: BIT:	HDW/FUN / 3/3		AE		.s: .: .:	HDW/	FUNC	
REDU	NDANCY	SCREENS:	A []		В []	ı	c []	
		DISPLAY			ANEL	R13A	.2			
CAUS	ES: PI	ECE-PART S	TRUCTURA	L FAIL	URE					
	CTS/RAT BACK MA	IONALE: Y NOT SHOW	CORRECT	' STATU	s.	-				₹ 15 5 5

DATE: 8/14/87 SUBSYSTEM: MECH/KBD/EPD&C MDAC ID: 4543	HIGHEST CRITICALITY HDW/FUNG FLIGHT: 3/2R ABORT: /
ITEM: AND GATE #1 FAILURE MODE: FAILS SHORTED	
LEAD ANALYST: A.D. MONTGOMERY	SUBSYS LEAD: H.J. LOWERY
BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) KU-BAND SUBSYSTEM 3) ELECTRICAL 4) MMC2 5) STOW 6) 7) 8) 9)	
CRITICAI	LITIES
FLIGHT PHASE HDW/FUNC PRELAUNCH: / LIFTOFF: / ONORBIT: 3/2R DEORBIT: / LANDING/SAFING: /	ABORT HDW/FUNC RTLS: / TAL: / AOA: / ATO: /
REDUNDANCY SCREENS: A [2]	B [F] C [P]
LOCATION: PART NUMBER: KBS.MC2.STW.AG1	
CAUSES: PIECE-PART STRUCTURAL FAIR	LURE
EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FA DEPLOYMENT OF THE ANTENNA.	AILURES COULD PREVENT
REFERENCES:	

HIGHEST CRITICALITY HDW/FUNC 8/14/87 DATE: FLIGHT: 3/1R SUBSYSTEM: MECH/KBD/EPD&C ABORT: MDAC ID: 4544 / ITEM: AND GATE #1 FAILURE MODE: FAILS OPEN LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) KU-BAND SUBSYSTEM ELECTRICAL 3) MMC2 4) 5) STOW 6) 7) 8) 9) CRITICALITIES HDW/FUNC ABORT FLIGHT PHASE HDW/FUNC RTLS: / PRELAUNCH: TAL: LIFTOFF: 3/1R AOA: ONORBIT: ATO: DEORBIT: / · LANDING/SAFING: / REDUNDANCY SCREENS: A [2] B [F] C [P] LOCATION: PART NUMBER: KBS.MC2.STW.AG1 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT STOWAGE OF THE ANTENNA.

DATE: 8/14/87 SUBSYSTEM: MECH/KBD/EPD&C MDAC ID: 4545	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/2R ABORT: /
ITEM: AND GATE #2 FAILURE MODE: FAILS SHORTED	
LEAD ANALYST: A.D. MONTGOMERY	SUBSYS LEAD: H.J. LOWERY
BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) KU-BAND SUBSYSTEM 3) ELECTRICAL 4) MMC2 5) STOW 6) 7) 8)	
CRITICALI	TTES
FLIGHT PHASE HDW/FUNC	ABORT HDW/FUNC
PRELAUNCH: /	RTLS: /
LIFTOFF: /	TAL: /
ONORBIT: 3/2R	AOA: /
DEORBIT: / LANDING/SAFING: /	ATO: /
HANDING DATING.	
REDUNDANCY SCREENS: A [2]	3 [F] C [P]
LOCATION: PART NUMBER: KBS.MC2.STW.AG2	
CAUSES: PIECE-PART STRUCTURAL FAILU	IRE
EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAISTOWAGE OF THE ANTENNA.	LURES COULD CAUSE UNCOMMANDED

HIGHEST CRITICALITY HDW/FUNC 8/14/87 DATE: SUBSYSTEM: MECH/KBD/EPD&C FLIGHT: 3/1R ABORT: MDAC ID: 4546 AND GATE #2 ITEM: FAILURE MODE: FAILS OPEN LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) KU-BAND SUBSYSTEM 3) ELECTRICAL 4) MMC2 5) STOW 6) 7) 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC

RTLS:

TAL:

3/1R AOA:

ATO: FLIGHT PHASE PRELAUNCH: LIFTOFF: ONORBIT: DEORBIT: LANDING/SAFING: / REDUNDANCY SCREENS: A [2] B [F] C [P] LOCATION: PART NUMBER: KBS.MC2.STW.AG2 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT STOWAGE OF THE ANTENNA.

HIGHEST CRITICALITY HDW/FUNC 8/14/87 DATE: 3/1R SUBSYSTEM: MECH/KBD/EPD&C FLIGHT: ABORT: MDAC ID: 4547 AND GATE #1 ITEM: FAILURE MODE: FAILS SHORTED LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM KU-BAND SUBSYSTEM 2) 3) ELECTRICAL 4) MMC2 DEPLOY 5) 6) 7) 8) 9) CRITICALITIES ABORT HDW/FUNC HDW/FUNC FLIGHT PHASE PRELAUNCH: RTLS: TAL: LIFTOFF: 3/1R AOA: ONORBIT: ATO: DEORBIT: LANDING/SAFING: A [2] B [F] C [P] REDUNDANCY SCREENS: LOCATION: PART NUMBER: KBS.MC2.EP.AG1 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT STOWAGE OF THE ANTENNA.

HIGHEST CRITICALITY HDW/FUNC 8/14/87 DATE: FLIGHT: 3/2R SUBSYSTEM: MECH/KBD/EPD&C ABORT: 4548 MDAC ID: ITEM: AND GATE #1 FAILURE MODE: FAILS OPEN LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) KU-BAND SUBSYSTEM ELECTRICAL 3) 4) MMC2 5) DEPLOY 6) 7) 8) 9) CRITICALITIES FLIGHT PHASE HDW/FUNC ABORT HDW/FUNC RTLS: PRELAUNCH: TAL: LIFTOFF: 3/2R AOA: ONORBIT: ATO: DEORBIT: LANDING/SAFING: REDUNDANCY SCREENS: A [2] B [F] C [P] LOCATION: PART NUMBER: KBS.MC2.EP.AG1 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT DEPLOYMENT OF THE ANTENNA.

HIGHEST CRITICALITY HDW/FUNC 8/14/87 FLIGHT: 3/1R SUBSYSTEM: MECH/KBD/EPD&C ABORT: 4549 MDAC ID: AND GATE #2 FAILURE MODE: FAILS SHORTED SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: A.D. MONTGOMERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM KU-BAND SUBSYSTEM 3) ELECTRICAL 4) MMC2 5) DEPLOY 6) 7) 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE PRELAUNCH: RTLS: TAL: LIFTOFF: 3/1R AOA: ONORBIT: ATO: DEORBIT: LANDING/SAFING: REDUNDANCY SCREENS: A [2] B [F] C [P] LOCATION: PART NUMBER: KBS.MC2.EP.AG2 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT STOWAGE OF THE ANTENNA.

HIGHEST CRITICALITY HDW/FUNC 8/14/87 DATE: 3/2R FLIGHT: MECH/KBD/EPD&C SUBSYSTEM: ABORT: 4550 MDAC ID: ITEM: AND GATE #2 FAILURE MODE: FAILS OPEN LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: MECHANICAL ACTUATION SYSTEM 1) KU-BAND SUBSYSTEM 2) ELECTRICAL 3) MMC2 4) **DEPLOY** 5) 6) 7) 8) 9) CRITICALITIES HDW/FUNC FLIGHT PHASE HDW/FUNC ABORT / PRELAUNCH: RTLS: LIFTOFF: TAL: 3/2R AOA: ONORBIT: ATO: **DEORBIT:** LANDING/SAFING: B [F] REDUNDANCY SCREENS: A [2] C [P] LOCATION: PART NUMBER: KBS.MC2.EP.AG2 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: SUBSEQUENT FAILURES COULD PREVENT NO IMMEDIATE EFFECT. DEPLOYMENT OF THE ANTENNA.

HIGHEST CRITICALITY HDW/FUNC 8/14/87 DATE: FLIGHT: 3/2R SUBSYSTEM: MECH/KBD/EPD&C ABORT: MDAC ID: 4551 AMP #1 ITEM: FAILURE MODE: FAILS SHORTED LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) KU-BAND SUBSYSTEM 3) ELECTRICAL 4) MMC2 5) STOW 6) 7) 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE RTLS: / PRELAUNCH: TAL: LIFTOFF: 3/2R AOA: ONORBIT: ATO: DEORBIT: LANDING/SAFING: REDUNDANCY SCREENS: A [2] B [F] C [P] LOCATION: PART NUMBER: KBS.MC2.STW.AM1 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT DEPLOYMENT OF THE ANTENNA.

HIGHEST CRITICALITY HDW/FUNC DATE: 8/14/87 SUBSYSTEM: MECH/KBD/EPD&C FLIGHT: 3/1R MDAC ID: ABORT: 4552 ITEM: AMP #1 FAILURE MODE: FAILS OPEN LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) KU-BAND SUBSYSTEM 3) ELECTRICAL 4) MMC2 5) STOW 6) 7) 8) 9) CRITICALITIES FLIGHT PHASE HDW/FUNC ABORT HDW/FUNC PRELAUNCH: / RTLS: / LIFTOFF: TAL: ONORBIT: 3/1R AOA: DEORBIT: ATO: LANDING/SAFING: REDUNDANCY SCREENS: A [2] B [F] C [P] LOCATION: PART NUMBER: KBS.MC2.STW.AM1 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT STOWAGE OF THE ANTENNA.

HIGHEST CRITICALITY HDW/FUNC 8/14/87 DATE: FLIGHT: 3/2R SUBSYSTEM: MECH/KBD/EPD&C ABORT: MDAC ID: 4553 AMP #2 ITEM: FAILS SHORTED FAILURE MODE: SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: A.D. MONTGOMERY BREAKDOWN HIERARCHY: MECHANICAL ACTUATION SYSTEM KU-BAND SUBSYSTEM 2) 3) ELECTRICAL 4) MMC2 5) STOW 6) 7) 8) 9) CRITICALITIES ABORT HDW/FUNC FLIGHT PHASE HDW/FUNC PRELAUNCH: RTLS: TAL: LIFTOFF: 3/2R AOA: ONORBIT: ATO: DEORBIT: LANDING/SAFING: A [2] B [F] C [P] REDUNDANCY SCREENS: LOCATION: PART NUMBER: KBS.MC2.STW.AM2 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT DEPLOYMENT OF THE ANTENNA.

HIGHEST CRITICALITY HDW/FUNC 8/14/87 DATE: SUBSYSTEM: MECH/KBD/EPD&C FLIGHT: 3/1R ABORT: MDAC ID: 4554 AMP #2 ITEM: FAILURE MODE: FAILS OPEN SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: A.D. MONTGOMERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) KU-BAND SUBSYSTEM 3) ELECTRICAL 4) MMC2 5) STOW 6) 7) 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE 1 PRELAUNCH: RTLS: TAL: LIFTOFF: 3/1R AOA: ONORBIT: DEORBIT: ATO: LANDING/SAFING: REDUNDANCY SCREENS: A [2] B [F] C [P] LOCATION: PART NUMBER: KBS.MC2.STW.AM2 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT STOWAGE OF THE ANTENNA.

HIGHEST CRITICALITY HDW/FUNC DATE: 8/14/87 3/1R FLIGHT: SUBSYSTEM: MECH/KBD/EPD&C ABORT: MDAC ID: 4555 AMP #1 ITEM: FAILURE MODE: FAILS SHORTED SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: A.D. MONTGOMERY BREAKDOWN HIERARCHY: MECHANICAL ACTUATION SYSTEM KU-BAND SUBSYSTEM 2) ELECTRICAL 3) MMC2 4) DEPLOY 5) 6) 7) 8) 9) CRITICALITIES HDW/FUNC FLIGHT PHASE ABORT HDW/FUNC RTLS: PRELAUNCH: TAL: LIFTOFF: 3/1R AOA: ONORBIT: ATO: DEORBIT: LANDING/SAFING: A [2] B [F] REDUNDANCY SCREENS: LOCATION: PART NUMBER: KBS.MC2.STW.AM1 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT STOWAGE OF THE ANTENNA.

HIGHEST CRITICALITY HDW/FUNC 8/14/87 DATE: SUBSYSTEM: MECH/KBD/EPD&C FLIGHT: 3/2R ABORT: MDAC ID: 4556 ITEM: AMP #1 FAILURE MODE: FAILS OPEN LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) KU-BAND SUBSYSTEM 3) ELECTRICAL 4) MMC2 5) DEPLOY 6) 7) 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE PRELAUNCH: / RTLS: TAL: LIFTOFF: 3/2R AOA: ONORBIT: ATO: DEORBIT: LANDING/SAFING: REDUNDANCY SCREENS: A [2] B[F] C[P] LOCATION: PART NUMBER: KBS.MC2.STW.AM1 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT DEPLOYMENT OF THE ANTENNA.

REFERENCES:

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HIGHEST CRITICALITY HDW/FUNC 8/14/87 DATE: 3/1R FLIGHT: SUBSYSTEM: MECH/KBD/EPD&C ABORT: MDAC ID: 4557 AMP #2 ITEM: FAILURE MODE: FAILS SHORTED SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: A.D. MONTGOMERY BREAKDOWN HIERARCHY: MECHANICAL ACTUATION SYSTEM KU-BAND SUBSYSTEM 2) ELECTRICAL 3) MMC2 4) 5) DEPLOY 6) 7) 8) 9) CRITICALITIES HDW/FUNC FLIGHT PHASE HDW/FUNC ABORT RTLS: PRELAUNCH: TAL: LIFTOFF: AOA: 3/1R ONORBIT: ATO: DEORBIT: LANDING/SAFING: A[2] B[F] C [P] REDUNDANCY SCREENS: LOCATION: PART NUMBER: KBS.MC2.STW.AM2 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT STOWAGE OF THE ANTENNA.

HIGHEST CRITICALITY HDW/FUNC 8/14/87 DATE: SUBSYSTEM: MECH/KBD/EPD&C FLIGHT: 3/2R ABORT: 4558 MDAC ID: AMP #2 ITEM: FAILURE MODE: FAILS OPEN ide**ratur** galak kabupatèn Paninga. LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) KU-BAND SUBSYSTEM 3) ELECTRICAL 4) MMC2 DEPLOY 5) 6) 7) 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE / RTLS: PRELAUNCH: / TAL: LIFTOFF: 3/2R AOA: ONORBIT: ATO: DEORBIT: LANDING/SAFING: REDUNDANCY SCREENS: A [2] B [F] C [P] LOCATION: PART NUMBER: KBS.MC2.STW.AM2 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT DEPLOYMENT OF THE ANTENNA.

HIGHEST CRITICALITY HDW/FUNC 8/14/87 DATE: 3/2R SUBSYSTEM: MECH/KBD/EPD&C FLIGHT: ABORT: 4559 MDAC ID: K14 ITEM: FAILURE MODE: FAILS SHORTED SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: A.D. MONTGOMERY BREAKDOWN HIERARCHY: MECHANICAL ACTUATION SYSTEM 2) KU-BAND SUBSYSTEM ELECTRICAL 3) MMC2 4) 5) RELAY 6) 7) 8) 9) CRITICALITIES FLIGHT PHASE ABORT HDW/FUNC HDW/FUNC RTLS: PRELAUNCH: TAL: LIFTOFF: 3/2R AOA: ONORBIT: ATO: DEORBIT: LANDING/SAFING: REDUNDANCY SCREENS: A [2] B [F] LOCATION: PART NUMBER: KBS.MC2.RLY.K14 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT DEPLOYMENT OF THE ANTENNA.

HIGHEST CRITICALITY HDW/FUNC 8/14/87 DATE: FLIGHT: 3/1R SUBSYSTEM: MECH/KBD/EPD&C ABORT: MDAC ID: ITEM: K14 FAILURE MODE: FAILS OPEN LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM KU-BAND SUBSYSTEM 3) ELECTRICAL 4) MMC2 5) RELAY 6) 7) 8) 9) CRITICALITIES ABORT HDW/FUNC HDW/FUNC FLIGHT PHASE RTLS: PRELAUNCH: / LIFTOFF: TAL: 3/1R AOA: ONORBIT: ATO: DEORBIT: LANDING/SAFING: B[F] C[P] REDUNDANCY SCREENS: A [2] LOCATION: PART NUMBER: KBS.MC2.RLY.K14 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT STOWAGE OF THE ANTENNA.

HIGHEST CRITICALITY HDW/FUNC DATE: 8/14/87 3/2R FLIGHT: SUBSYSTEM: MECH/KBD/EPD&C ABORT: 4561 MDAC ID: K68 ITEM: FAILURE MODE: FAILS SHORTED LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: MECHANICAL ACTUATION SYSTEM KU-BAND SUBSYSTEM 2) ELECTRICAL 3) MMC2 4) RELAY 5) 6) 7) 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE RTLS: PRELAUNCH: TAL: LIFTOFF: AOA: 3/2R ONORBIT: ATO: DEORBIT: LANDING/SAFING: REDUNDANCY SCREENS: A [2] B [F] C [P] LOCATION: PART NUMBER: KBS.MC2.RLY.K68 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT DEPLOYMENT OF THE ANTENNA.

HIGHEST CRITICALITY HDW/FUNC 8/14/87 DATE: FLIGHT: 3/1R SUBSYSTEM: MECH/KBD/EPD&C ABORT: MDAC ID: 4562 ITEM: K68 FAILURE MODE: FAILS OPEN SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: A.D. MONTGOMERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) KU-BAND SUBSYSTEM ELECTRICAL 3) 4) MMC2 5) RELAY 6) 7) 8) 9) CRITICALITIES FLIGHT PHASE HDW/FUNC ABORT HDW/FUNC RTLS: PRELAUNCH: TAL: LIFTOFF: 3/1R AOA: ONORBIT: ATO: DEORBIT: LANDING/SAFING: B[F] C[P] REDUNDANCY SCREENS: A [2] LOCATION: PART NUMBER: KBS.MC2.RLY.K68 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT STOWAGE OF THE ANTENNA.

HIGHEST CRITICALITY HDW/FUNC DATE: 8/14/87 3/1R FLIGHT: SUBSYSTEM: MECH/KBD/EPD&C 4563 ABORT: MDAC ID: K72 ITEM: FAILURE MODE: FAILS SHORTED SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: A.D. MONTGOMERY BREAKDOWN HIERARCHY: MECHANICAL ACTUATION SYSTEM KU-BAND SUBSYSTEM 3) ELECTRICAL MMC2 4) 5) RELAY 6) 7) 8) CRITICALITIES HDW/FUNC FLIGHT PHASE HDW/FUNC ABORT RTLS: PRELAUNCH: / TAL: LIFTOFF: 3/1R AOA: ONORBIT: ATO: DEORBIT: LANDING/SAFING: C [P] A [2] B [F] REDUNDANCY SCREENS: LOCATION: PART NUMBER: KBS.MC2.RLY.K72 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: SUBSEQUENT FAILURES COULD PREVENT STOWAGE NO IMMEDIATE EFFECT. OF THE ANTENNA.

HIGHEST CRITICALITY HDW/FUNC DATE: 8/14/87 SUBSYSTEM: MECH/KBD/EPD&C FLIGHT: 3/2R ABORT: /- --4564 MDAC ID: ITEM: K72 FAILURE MODE: FAILS OPEN SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: A.D. MONTGOMERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) KU-BAND SUBSYSTEM 3) ELECTRICAL 4) MMC2 5) RELAY 6) 7) 8) 9) CRITICALITIES FLIGHT PHASE HDW/FUNC ABORT HDW/FUNC 1 PRELAUNCH: RTLS: TAL: LIFTOFF: 3/2R AOA: ONORBIT: / ATO: DEORBIT: LANDING/SAFING: REDUNDANCY SCREENS: A [2] B [F] C [P] LOCATION: PART NUMBER: KBS.MC2.RLY.K72 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT

REFERENCES:

DEPLOYMENT OF THE ANTENNA.

HIGHEST CRITICALITY HDW/FUNC 8/14/87 DATE: 3/1R FLIGHT: SUBSYSTEM: MECH/KBD/EPD&C ABORT: MDAC ID: 4565 K70 ITEM: FAILURE MODE: FAILS SHORTED SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: A.D. MONTGOMERY BREAKDOWN HIERARCHY: MECHANICAL ACTUATION SYSTEM KU-BAND SUBSYSTEM 3) ELECTRICAL MMC2 4) RELAY 5) 6) 7) 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE RTLS: PRELAUNCH: / TAL: LIFTOFF: 3/1R AOA: ONORBIT: ATO: DEORBIT: LANDING/SAFING: / B [F] C [P] REDUNDANCY SCREENS: A [2] LOCATION: PART NUMBER: KBS.MC2.RLY.K70 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT STOWAGE OF THE ANTENNA.

HIGHEST CRITICALITY HDW/FUNC DATE: 8/14/87 FLIGHT: 3/2R SUBSYSTEM: MECH/KBD/EPD&C ABORT: MDAC ID: ITEM: K70 FAILURE MODE: FAILS OPEN SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: A.D. MONTGOMERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) KU-BAND SUBSYSTEM 3) ELECTRICAL 4) MMC2 5) RELAY 6) 7) 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE / RTLS: PRELAUNCH: TAL: LIFTOFF: AOA: 3/2R ONORBIT: ATO: / DEORBIT: LANDING/SAFING: / REDUNDANCY SCREENS: A [2] B [F] C [P] LOCATION: PART NUMBER: KBS.MC2.RLY.K70 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT DEPLOYMENT OF THE ANTENNA.

HIGHEST CRITICALITY HDW/FUNC 8/14/87 DATE: 3/1R FLIGHT: SUBSYSTEM: MECH/KBD/EPD&C ABORT: MDAC ID: 4567 STOW MICROSWITCH #1 ITEM: FAILURE MODE: FAILS SHORTED SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: A.D. MONTGOMERY BREAKDOWN HIERARCHY: MECHANICAL ACTUATION SYSTEM 2) KU-BAND SUBSYSTEM ELECTRICAL 3) 4) 5) 6) 7) 8) 9) CRITICALITIES FLIGHT PHASE HDW/FUNC ABORT HDW/FUNC RTLS: / PRELAUNCH: TAL: LIFTOFF: 3/1R AOA: ONORBIT: / ATO: DEORBIT: LANDING/SAFING: REDUNDANCY SCREENS: A [2] B [F] C [P] LOCATION: PART NUMBER: KBS.SMS.1 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: LOSS OF ONE MOTOR DURING STOW OPERATIONS. SUBSEQUENT FAILURES COULD PREVENT STOWAGE OF THE ANTENNA.

DATE: 8/14/87 SUBSYSTEM: MECH/KBD/EPD&C MDAC ID: 4568	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: /
ITEM: STOW MICROSWITCH #1 FAILURE MODE: FAILS OPEN	
LEAD ANALYST: A.D. MONTGOMERY	SUBSYS LEAD: H.J. LOWERY
BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) KU-BAND SUBSYSTEM 3) ELECTRICAL 4) 5) 6) 7) 8)	
CRITICAL	ITIES
FLIGHT PHASE HDW/FUNC PRELAUNCH: / LIFTOFF: / ONORBIT: 3/3 DEORBIT: / LANDING/SAFING: /	ABORT HDW/FUNC RTLS: / TAL: / AOA: / ATO: /
REDUNDANCY SCREENS: A []	в[] С[]
LOCATION: PART NUMBER: KBS.SMS.1	
CAUSES: PIECE-PART STRUCTURAL FAIL	URE
EFFECTS/RATIONALE: NO EFFECT.	

HIGHEST CRITICALITY HDW/FUNC 8/14/87 DATE: FLIGHT: 3/2R SUBSYSTEM: MECH/KBD/EPD&C ABORT: MDAC ID: 4569 DEPLOY MICROSWITCH #1 ITEM: FAILURE MODE: FAILS SHORTED LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: MECHANICAL ACTUATION SYSTEM KU-BAND SUBSYSTEM ELECTRICAL 3) 4) 5) 6) 7) 8) 9) CRITICALITIES ABORT HDW/FUNC FLIGHT PHASE HDW/FUNC RTLS: PRELAUNCH: TAL: · LIFTOFF: 3/2R AOA: ONORBIT: ATO: DEORBIT: LANDING/SAFING: REDUNDANCY SCREENS: A [2] B [F] C [P] LOCATION: PART NUMBER: KBS.DMS.1 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: LOSS OF ONE MOTOR DURING DEPLOY OPERATIONS. SUBSEQUENT FAILURES COULD PREVENT DEPLOYMENT OF THE ANTENNA.

DATE: 8/14/87 SUBSYSTEM: MECH/KBD/EPD&C MDAC ID: 4570	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: /	
ITEM: DEPLOY MICROSWITCH FAILURE MODE: FAILS OPEN	#1 	
LEAD ANALYST: A.D. MONTGOMERY	SUBSYS LEAD: H.J. LOWERY	
BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) KU-BAND SUBSYSTEM 3) ELECTRICAL 4) 5) 6) 7) 8)		
CRITICALITIES		
FLIGHT PHASE HDW/FUNC PRELAUNCH: / LIFTOFF: / ONORBIT: 3/3 DEORBIT: / LANDING/SAFING: /	ABORT HDW/FUNC RTLS: / TAL: / AOA: / ATO: /	
REDUNDANCY SCREENS: A []	в[] с[]	
LOCATION: PART NUMBER: KBS.DMS.1		
CAUSES: PIECE-PART STRUCTURAL FAI	LURE	
EFFECTS/RATIONALE: NO EFFECT.		

8/14/87 HIGHEST CRITICALITY HDW/FUNC DATE: SUBSYSTEM: MECH/KBD/EPD&C FLIGHT: 3/2RABORT: MDAC ID: 4571 ITEM: AND GATE #1 FAILURE MODE: FAILS SHORTED LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: MECHANICAL ACTUATION SYSTEM KU-BAND SUBSYSTEM 2) ELECTRICAL 3) MMC4 4) STOW 5) 6) 7) 8) 9) CRITICALITIES ABORT HDW/FUNC FLIGHT PHASE HDW/FUNC PRELAUNCH: RTLS: LIFTOFF: TAL: 3/2R AOA: ONORBIT: ATO: DEORBIT: LANDING/SAFING: REDUNDANCY SCREENS: A [2] B [F] C [P] LOCATION: PART NUMBER: KBS.MC4.STW.AG1 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: SUBSEQUENT FAILURES COULD PREVENT NO IMMEDIATE EFFECT. DEPLOYMENT OF THE ANTENNA.

HIGHEST CRITICALITY HDW/FUNC 8/14/87 DATE: SUBSYSTEM: MECH/KBD/EPD&C MDAC ID: 4572 FLIGHT: 3/1R ABORT: / TTEM: AND GATE #1 FAILURE MODE: FAILS OPEN LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) KU-BAND SUBSYSTEM 3) ELECTRICAL 4) MMC4 5) STOW 6) 7) 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE RTLS: TAL: / . PRELAUNCH: LIFTOFF: AOA: 3/1R ONORBIT: DEORBIT: ATO: LANDING/SAFING: / REDUNDANCY SCREENS: A [2] B [F] C [P] LOCATION: PART NUMBER: KBS.MC4.STW.AG1 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT STOWAGE OF THE ANTENNA.

8/14/87 HIGHEST CRITICALITY HDW/FUNC DATE: FLIGHT: 3/2R SUBSYSTEM: MECH/KBD/EPD&C ABORT: MDAC ID: 4573 ITEM: AND GATE #2 FAILURE MODE: FAILS SHORTED SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: A.D. MONTGOMERY BREAKDOWN HIERARCHY: MECHANICAL ACTUATION SYSTEM KU-BAND SUBSYSTEM 2) 3) ELECTRICAL MMC4 4) 5) STOW 6) 7) 8) 9) CRITICALITIES ABORT HDW/FUNC FLIGHT PHASE HDW/FUNC RTLS: PRELAUNCH: / TAL: LIFTOFF: AOA: 3/2R ONORBIT: ATO: DEORBIT: LANDING/SAFING: A [2] B [F] C [P] REDUNDANCY SCREENS: LOCATION: PART NUMBER: KBS.MC4.STW.AG2 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT DEPLOYMENT OF THE ANTENNA.

HIGHEST CRITICALITY HDW/FUNC DATE: 8/14/87 SUBSYSTEM: MECH/KBD/EPD&C FLIGHT: 3/1R ABORT: MDAC ID: 4574 AND GATE #2 ITEM: FAILURE MODE: FAILS OPEN LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) KU-BAND SUBSYSTEM 3) ELECTRICAL 4) MMC4 5) STOW 6) 7) 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE RTLS: TAL: AOA: / PRELAUNCH: LIFTOFF: 3/1R ONORBIT: DEORBIT: ATO: LANDING/SAFING: REDUNDANCY SCREENS: A [2] B [F] C [P] LOCATION: PART NUMBER: KBS.MC4.STW.AG2 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT STOWAGE OF THE ANTENNA. e de la merca de la forma de la composición del composición de la composición del composición de la composición del composición de la composición del composición de la compos

HIGHEST CRITICALITY HDW/FUNC 8/14/87 DATE: 3/1R FLIGHT: SUBSYSTEM: MECH/KBD/EPD&C ABORT: MDAC ID: 4575 AND GATE #1 ITEM: FAILURE MODE: FAILS SHORTED SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: A.D. MONTGOMERY BREAKDOWN HIERARCHY: MECHANICAL ACTUATION SYSTEM KU-BAND SUBSYSTEM 2) ELECTRICAL 3) MMC4 4) 5) DEPLOY 6) 7) 8) 9) CRITICALITIES FLIGHT PHASE HDW/FUNC ABORT HDW/FUNC RTLS: PRELAUNCH: TAL: LIFTOFF: 3/1R AOA: ONORBIT: ATO: DEORBIT: LANDING/SAFING: A[2] B[F] C[P] REDUNDANCY SCREENS: LOCATION: PART NUMBER: KBS.MC4.DEP.AG1 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT STOWAGE OF THE ANTENNA.

HIGHEST CRITICALITY HDW/FUNC DATE: 8/14/87 SUBSYSTEM: MECH/KBD/EPD&C FLIGHT: 3/2R4576 ABORT: MDAC ID: AND GATE #1 ITEM: FAILURE MODE: FAILS OPEN LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) KU-BAND SUBSYSTEM 3) ELECTRICAL 4) MMC4 DEPLOY 5) 6) 7) 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE / RTLS: PRELAUNCH: TAL: LIFTOFF: 3/2R AOA: ONORBIT: DEORBIT: ATO: LANDING/SAFING: REDUNDANCY SCREENS: A [2] B [F] C [P] LOCATION: PART NUMBER: KBS.MC4.DEP.AG1 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT DEPLOYMENT OF THE ANTENNA.

HIGHEST CRITICALITY HDW/FUNC 8/14/87 DATE: 3/1R FLIGHT: SUBSYSTEM: MECH/KBD/EPD&C ABORT: 4577 MDAC ID: AND GATE #2 ITEM: FAILURE MODE: FAILS SHORTED SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: A.D. MONTGOMERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM KU-BAND SUBSYSTEM 2) ELECTRICAL 3) MMC4 4) DEPLOY 5) 6) 7) 8) 9) CRITICALITIES ABORT HDW/FUNC FLIGHT PHASE HDW/FUNC RTLS: PRELAUNCH: TAL: LIFTOFF: 3/1R AOA: ONORBIT: ATO: DEORBIT: LANDING/SAFING: B[F] C[P] REDUNDANCY SCREENS: A [2] LOCATION: PART NUMBER: KBS.MC4.DEP.AG2 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT STOWAGE OF THE ANTENNA.

HIGHEST CRITICALITY HDW/FUNC 8/14/87 DATE: FLIGHT: SUBSYSTEM: MECH/KBD/EPD&C 3/2R ABORT: MDAC ID: 4578 AND GATE #2 ITEM: FAILURE MODE: FAILS OPEN LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) KU-BAND SUBSYSTEM 3) ELECTRICAL 4) MMC4 5) DEPLOY 6) 7) 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE RTLS: TAL: AOA: 3/2R PRELAUNCH: LIFTOFF: ONORBIT: DEORBIT: ATO: LANDING/SAFING: / REDUNDANCY SCREENS: A [2] B [F] C [P] LOCATION: PART NUMBER: KBS.MC4.DEP.AG2 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT DEPLOYMENT OF THE ANTENNA.

HIGHEST CRITICALITY HDW/FUNC 8/14/87 DATE: 3/2R FLIGHT: SUBSYSTEM: MECH/KBD/EPD&C ABORT: MDAC ID: 4579 AMP #1 ITEM: FAILURE MODE: FAILS SHORTED SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: A.D. MONTGOMERY BREAKDOWN HIERARCHY: MECHANICAL ACTUATION SYSTEM 2) KU-BAND SUBSYSTEM 3) ELECTRICAL MMC4 4) STOW 5) 6) 7) 8) 9) CRITICALITIES ABORT HDW/FUNC FLIGHT PHASE HDW/FUNC RTLS: PRELAUNCH: TAL: LIFTOFF: 3/2R AOA: ONORBIT: ATO: DEORBIT: LANDING/SAFING: B [F] C [P] REDUNDANCY SCREENS: A [2] LOCATION: PART NUMBER: KBS.MC4.STW.AM1 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT DEPLOYMENT OF THE ANTENNA.

HIGHEST CRITICALITY HDW/FUNC 8/14/87 DATE: SUBSYSTEM: MECH/KBD/EPD&C 3/1R FLIGHT: ABORT: 4580 MDAC ID: ITEM: AMP #1 FAILURE MODE: FAILS OPEN SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: A.D. MONTGOMERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) KU-BAND SUBSYSTEM 3) ELECTRICAL 4) MMC4 5) STOW 6) 7) 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE RTLS: / PRELAUNCH: / TAL: LIFTOFF: 3/1R AOA: ONORBIT: DEORBIT: ATO: LANDING/SAFING: REDUNDANCY SCREENS: A [2] B [F] C [P] LOCATION: PART NUMBER: KBS.MC4.STW.AM1 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT STOWAGE OF THE ANTENNA.

HDW/FUNC HIGHEST CRITICALITY 8/14/87 DATE: 3/2R FLIGHT: SUBSYSTEM: MECH/KBD/EPD&C ABORT: MDAC ID: 4581 AMP #2 ITEM: FAILURE MODE: FAILS SHORTED LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: MECHANICAL ACTUATION SYSTEM KU-BAND SUBSYSTEM 2) ELECTRICAL 3) MMC4 4) 5) STOW 6) 7) 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE RTLS: PRELAUNCH: TAL: LIFTOFF: 3/2R AOA: ONORBIT: ATO: DEORBIT: LANDING/SAFING: REDUNDANCY SCREENS: A [2] B [F] C [P] LOCATION: PART NUMBER: KBS.MC4.STW.AM2 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT DEPLOYMENT OF THE ANTENNA.

HIGHEST CRITICALITY HDW/FUNC DATE: 8/14/87 SUBSYSTEM: MECH/KBD/EPD&C FLIGHT: 3/1R MDAC ID: 4582 ABORT: / AMP #2 ITEM: FAILURE MODE: FAILS OPEN SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: A.D. MONTGOMERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) KU-BAND SUBSYSTEM
3) ELECTRICAL 4) MMC4 5) STOW 6) 7) 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE RTLS: PRELAUNCH: / TAL: LIFTOFF: 3/1R AOA: ONORBIT: ATO: DEORBIT: LANDING/SAFING: / REDUNDANCY SCREENS: A [2] B [F] C [P] LOCATION: PART NUMBER: KBS.MC4.STW.AM2 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT STOWAGE OF THE ANTENNA. REFERENCES:

HIGHEST CRITICALITY HDW/FUNC DATE: 8/14/87 3/1R FLIGHT: SUBSYSTEM: MECH/KBD/EPD&C ABORT: / MDAC ID: 4583 AMP #1 ITEM: FAILS SHORTED FAILURE MODE: SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: A.D. MONTGOMERY BREAKDOWN HIERARCHY: MECHANICAL ACTUATION SYSTEM KU-BAND SUBSYSTEM 2) ELECTRICAL 3) MMC4 4) DEPLOY 5) 6) 7) 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE RTLS: PRELAUNCH: TAL: LIFTOFF: 3/1R AOA: ONORBIT: ATO: DEORBIT: LANDING/SAFING: B [F] C [P] REDUNDANCY SCREENS: A [2] LOCATION: PART NUMBER: KBS.MC4.DEP.AM1 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: SUBSEQUENT FAILURES COULD PREVENT STOWAGE NO IMMEDIATE EFFECT. OF THE ANTENNA.

HIGHEST CRITICALITY HDW/FUNC DATE: 8/14/87 SUBSYSTEM: MECH/KBD/EPD&C FLIGHT: 3/2R ABORT: 4584 MDAC ID: AMP #1 ITEM: FAILURE MODE: FAILS OPEN LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) KU-BAND SUBSYSTEM 3) ELECTRICAL 4) MMC4 5) DEPLOY 6) 7) 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE RTLS: / PRELAUNCH: TAL: LIFTOFF: 3/2R AOA: ONORBIT: ATO: DEORBIT: LANDING/SAFING: REDUNDANCY SCREENS: A [2] B [F] C [P] LOCATION: PART NUMBER: KBS.MC4.DEP.AM1 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT DEPLOYMENT OF THE ANTENNA.

HIGHEST CRITICALITY HDW/FUNC 8/14/87 DATE: FLIGHT: 3/1R SUBSYSTEM: MECH/KBD/EPD&C ABORT: 4585 MDAC ID: AMP #2 ITEM: FAILURE MODE: FAILS SHORTED SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: A.D. MONTGOMERY BREAKDOWN HIERARCHY: MECHANICAL ACTUATION SYSTEM KU-BAND SUBSYSTEM 3) ELECTRICAL 4) MMC4 DEPLOY 5) 6) 7) 8) 9) CRITICALITIES ABORT HDW/FUNC FLIGHT PHASE HDW/FUNC RTLS: PRELAUNCH: TAL: LIFTOFF: 3/1R AOA: ONORBIT: ATO: DEORBIT: LANDING/SAFING: A [2] B [F] C [P] REDUNDANCY SCREENS: LOCATION: PART NUMBER: KBS.MC4.DEP.AM2 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: SUBSEQUENT FAILURES COULD PREVENT STOWAGE NO IMMEDIATE EFFECT. OF THE ANTENNA.

HIGHEST CRITICALITY HDW/FUNC 8/14/87 DATE: 3/2R SUBSYSTEM: MECH/KBD/EPD&C FLIGHT: ABORT: MDAC ID: 4586 AMP #2 ITEM: FAILURE MODE: FAILS OPEN LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) KU-BAND SUBSYSTEM 3) ELECTRICAL 4) MMC4 5) DEPLOY 6) 7) 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE RTLS: PRELAUNCH: / TAL: LIFTOFF: 3/2R AOA: ONORBIT: ATO: DEORBIT: LANDING/SAFING: REDUNDANCY SCREENS: A [2] B [F] C [P] LOCATION: PART NUMBER: KBS.MC4.DEP.AM2 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT DEPLOYMENT OF THE ANTENNA.

HIGHEST CRITICALITY HDW/FUNC DATE: 8/14/87 3/2R FLIGHT: SUBSYSTEM: MECH/KBD/EPD&C ABORT: 4587 MDAC ID: K25 ITEM: FAILURE MODE: FAILS SHORTED SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: A.D. MONTGOMERY BREAKDOWN HIERARCHY: MECHANICAL ACTUATION SYSTEM KU-BAND SUBSYSTEM 3) ELECTRICAL 4) MMC4 RELAY 5) 6) 7) 8) 9) CRITICALITIES ABORT HDW/FUNC FLIGHT PHASE HDW/FUNC / PRELAUNCH: RTLS: TAL: LIFTOFF: 3/2R AOA: ONORBIT: ATO: DEORBIT: LANDING/SAFING: REDUNDANCY SCREENS: A [2] B [F] C[P] LOCATION: PART NUMBER: KBS.MC4.RLY.K25 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT DEPLOYMENT OF THE ANTENNA.

HIGHEST CRITICALITY HDW/FUNC DATE: 8/14/87 FLIGHT: 3/1R SUBSYSTEM: MECH/KBD/EPD&C ABORT: MDAC ID: 4588 ITEM: K25 नामसंग्रह्मका अर्देशको ४०० स्टब्स् सामसंग्रह्मका FAILURE MODE: FAILS OPEN LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) KU-BAND SUBSYSTEM 3) ELECTRICAL 4) MMC4 5) RELAY 6) 7) 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE RTLS: / / PRELAUNCH: TAL: LIFTOFF: AOA: 3/1R ONORBIT: DEORBIT: ATO: LANDING/SAFING: REDUNDANCY SCREENS: A [2] B [F] C [P] LOCATION: PART NUMBER: KBS.MC4.RLY.K25 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT STOWAGE OF THE ANTENNA.

HIGHEST CRITICALITY HDW/FUNC 8/14/87 DATE: FLIGHT: 3/2R SUBSYSTEM: MECH/KBD/EPD&C ABORT: / MDAC ID: 4589 K2 ITEM: FAILURE MODE: FAILS SHORTED SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: A.D. MONTGOMERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM KU-BAND SUBSYSTEM 2) ELECTRICAL 3) 4) MMC4 5) RELAY 6) 7) 8) 9) CRITICALITIES ABORT HDW/FUNC HDW/FUNC FLIGHT PHASE RTLS: PRELAUNCH: TAL: LIFTOFF: 3/2R AOA: ONORBIT: ATO: DEORBIT: LANDING/SAFING: / REDUNDANCY SCREENS: A [2] B [F] C [P] LOCATION: PART NUMBER: KBS.MC4.RLY.K2 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT DEPLOYMENT OF THE ANTENNA.

HIGHEST CRITICALITY HDW/FUNC 8/14/87 DATE: SUBSYSTEM: MECH/KBD/EPD&C FLIGHT: 3/1R ABORT: MDAC ID: 4591 ITEM: K2 FAILURE MODE: FAILS OPEN LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) KU-BAND SUBSYSTEM 3) ELECTRICAL 4) MMC4 5) RELAY 6) 7) 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE RTLS: PRELAUNCH: / TAL: LIFTOFF: 3/1R AOA: ONORBIT: DEORBIT: ATO: LANDING/SAFING: REDUNDANCY SCREENS: A [2] B [F] C[P] LOCATION: PART NUMBER: KBS.MC4.RLY.K2 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT STOWAGE OF THE ANTENNA.

HIGHEST CRITICALITY HDW/FUNC 8/14/87 DATE: 3/1R FLIGHT: SUBSYSTEM: MECH/KBD/EPD&C ABORT: MDAC ID: 4592 K27 ITEM: FAILURE MODE: FAILS SHORTED SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: A.D. MONTGOMERY BREAKDOWN HIERARCHY: MECHANICAL ACTUATION SYSTEM KU-BAND SUBSYSTEM 2) ELECTRICAL 3) MMC4 4) RELAY 5) 6) 7) 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE RTLS: PRELAUNCH: TAL: LIFTOFF: 3/1R AOA: ONORBIT: ATO: DEORBIT: LANDING/SAFING: REDUNDANCY SCREENS: A [2] B [F] C [P] LOCATION: PART NUMBER: KBS.MC4.RLY.K27 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: SUBSEQUENT FAILURES COULD PREVENT STOWAGE NO IMMEDIATE EFFECT. OF THE ANTENNA.

HIGHEST CRITICALITY HDW/FUNC DATE: 8/14/87 3/2R FLIGHT: SUBSYSTEM: MECH/KBD/EPD&C ABORT: MDAC ID: 4593 ITEM: K27 FAILURE MODE: FAILS OPEN LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) KU-BAND SUBSYSTEM
3) ELECTRICAL 4) MMC4 5) RELAY 6) 7) 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE PRELAUNCH: RTLS: / TAL: LIFTOFF: 3/2R AOA: ONORBIT: ATO: DEORBIT: LANDING/SAFING: REDUNDANCY SCREENS: A [2] B [F] C [P] LOCATION: PART NUMBER: KBS.MC4.RLY.K27 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT DEPLOYMENT OF THE ANTENNA.

HIGHEST CRITICALITY HDW/FUNC 8/14/87 DATE: FLIGHT: 3/1R SUBSYSTEM: MECH/KBD/EPD&C ABORT: MDAC ID: 4594 K37 ITEM: FAILURE MODE: FAILS SHORTED LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM KU-BAND SUBSYSTEM 2) 3) ELECTRICAL 4) MMC4 RELAY 5) 6) 7) 8) 9) CRITICALITIES HDW/FUNC HDW/FUNC ABORT FLIGHT PHASE RTLS: PRELAUNCH: TAL: LIFTOFF: 3/1R AOA: ONORBIT: ATO: DEORBIT: LANDING/SAFING: REDUNDANCY SCREENS: A [2] B [F] C [P] LOCATION: PART NUMBER: KBS.MC4.RLY.K37 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT STOWAGE OF THE ANTENNA.

HIGHEST CRITICALITY HDW/FUNC DATE: 8/14/87 SUBSYSTEM: MECH/KBD/EPD&C FLIGHT: 3/2R ABORT: MDAC ID: 4595 ITEM: K37 FAILURE MODE: FAILS OPEN SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: A.D. MONTGOMERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM KU-BAND SUBSYSTEM ELECTRICAL 3) 4) MMC4 RELAY 5) 6) 7) 8) 9) CRITICALITIES HDW/FUNC HDW/FUNC FLIGHT PHASE ABORT PRELAUNCH: RTLS: / TAL: LIFTOFF: 3/2R ONORBIT: AOA: DEORBIT: ATO: LANDING/SAFING: REDUNDANCY SCREENS: A [2] B [F] C [P] LOCATION: PART NUMBER: KBS.MC4.RLY.K37 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT DEPLOYMENT OF THE ANTENNA.

HIGHEST CRITICALITY HDW/FUNC 8/14/87 DATE: 3/1R FLIGHT: SUBSYSTEM: MECH/KBD/EPD&C ABORT: MDAC ID: 4596 STOW MICROSWITCH #2 ITEM: FAILURE MODE: FAILS SHORTED SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: A.D. MONTGOMERY BREAKDOWN HIERARCHY: MECHANICAL ACTUATION SYSTEM KU-BAND SUBSYSTEM 2) ELECTRICAL 3) 4) 5) 6) 7) 8) 9) CRITICALITIES ABORT HDW/FUNC HDW/FUNC FLIGHT PHASE RTLS: PRELAUNCH: TAL: LIFTOFF: 3/1R AOA: ONORBIT: ATO: DEORBIT: LANDING/SAFING: A [2] B [F] C [P] REDUNDANCY SCREENS: LOCATION: PART NUMBER: KBS.SMS.2 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: LOSS OF ONE MOTOR DURING STOW OPERATIONS. SUBSEQUENT FAILURES COULD PREVENT STOWAGE OF THE ANTENNA.

DATE: 8/14/87 SUBSYSTEM: MECH/KBD/EPD&C MDAC ID: 4597	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: /
ITEM: STOW MICROSWITCH #2 FAILURE MODE: FAILS OPEN	
LEAD ANALYST: A.D. MONTGOMERY	SUBSYS LEAD: H.J. LOWERY
BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) KU-BAND SUBSYSTEM 3) ELECTRICAL 4) 5) 6) 7) 8) 9)	
CRITICAL	
FLIGHT PHASE HDW/FUNC PRELAUNCH: / LIFTOFF: / ONORBIT: 3/3 DEORBIT: / LANDING/SAFING: /	ABORT HDW/FUNC RTLS: / TAL: / AOA: / ATO: /
REDUNDANCY SCREENS: A []	B [] C []
LOCATION: PART NUMBER: KBS.SMS.2	
CAUSES: PIECE-PART STRUCTURAL FAIL	JRE
EFFECTS/RATIONALE: NO EFFECT.	

HIGHEST CRITICALITY HDW/FUNC 8/14/87 DATE: FLIGHT: 3/2R SUBSYSTEM: MECH/KBD/EPD&C ABORT: MDAC ID: 4598 DEPLOY MICROSWITCH #2 ITEM: FAILURE MODE: FAILS SHORTED LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM KU-BAND SUBSYSTEM 2) ELECTRICAL 3) 4) 5) 6) 7) 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE PRELAUNCH: RTLS: / TAL: LIFTOFF: 3/2R AOA: ONORBIT: ATO: DEORBIT: LANDING/SAFING: REDUNDANCY SCREENS: A [2] B [F] C [P] LOCATION: PART NUMBER: KBS.DMS.2 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: LOSS OF ONE MOTOR DURING DEPLOY OPERATIONS. SUBSEQUENT FAILURES COULD PREVENT DEPLOYMENT OF THE ANTENNA. REFERENCES:

DATE: 8/14/87 SUBSYSTEM: MECH/KBD/EPD&C MDAC ID: 4599	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: /
ITEM: DEPLOY MICROSWITCH FAILURE MODE: FAILS OPEN	#2
LEAD ANALYST: A.D. MONTGOMERY	SUBSYS LEAD: H.J. LOWERY
BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) KU-BAND SUBSYSTEM 3) ELECTRICAL 4) 5) 6) 7) 8)	
CRITICA	ALITIES
FLIGHT PHASE HDW/FUNC PRELAUNCH: / LIFTOFF: / ONORBIT: 3/3 DEORBIT: / LANDING/SAFING: /	ABORT HDW/FUNC RTLS: / TAL: / AOA: / ATO: /
REDUNDANCY SCREENS: A []	B [] C []
LOCATION: PART NUMBER: KBS.DMS.2	
CAUSES: PIECE-PART STRUCTURAL FAI	LURE
EFFECTS/RATIONALE: NO EFFECT.	
REFERENCES:	

HIGHEST CRITICALITY HDW/FUNC 8/21/87 DATE: FLIGHT: 3/1R SUBSYSTEM: MECH/KBD/EPD&C ABORT: MDAC ID: 4600 +28V CONTACT #1 ITEM: FAILURE MODE: FAILS SHORTED SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: A.D. MONTGOMERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) KU-BAND SUBSYSTEM 3) ELECTRICAL DISPLAY AND CONTROLS 4) SWITCHES 5) 6) ARM/SAFE ARM POSITION 7) 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE RTLS: / / PRELAUNCH: TAL: LIFTOFF: 3/1R AOA: ONORBIT: ATO: DEORBIT: LANDING/SAFING: REDUNDANCY SCREENS: A [2] B [F] C [P] LOCATION: PART NUMBER: KBS.DC.SW.AS.AP.CN1 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD JETTISON ANTENNA.

8/21/87 HIGHEST CRITICALITY HDW/FUNC DATE: SUBSYSTEM: MECH/KBD/EPD&C FLIGHT: 3/1R ABORT: MDAC ID: 4601 +28V CONTACT #1 ITEM: FAILURE MODE: FAILS OPEN LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) KU-BAND SUBSYSTEM 3) ELECTRICAL 4) DISPLAY AND CONTROLS 5) SWITCHES 6) ARM/SAFE 7) ARM POSITION 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE RTLS: TAL: AOA: , PRELAUNCH: LIFTOFF: 3/1R ONORBIT: DEORBIT: ATO: LANDING/SAFING: / REDUNDANCY SCREENS: A [2] B [F] C [P] LOCATION: PART NUMBER: KBS.DC.SW.AS.AP.CN1 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT JETTISON OF THE ANTENNA.

HIGHEST CRITICALITY HDW/FUNC 8/21/87 FLIGHT: 3/1R SUBSYSTEM: MECH/KBD/EPD&C ABORT: MDAC ID: 4602 +28V CONTACT #2 ITEM: FAILURE MODE: FAILS SHORTED LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) KU-BAND SUBSYSTEM 3) ELECTRICAL 4) DISPLAY AND CONTROLS 5) SWITCHES 6) ARM/SAFE 7) ARM POSITION 8) 9) CRITICALITIES HDW/FUNC HDW/FUNC ABORT FLIGHT PHASE RTLS: PRELAUNCH: / TAL: LIFTOFF: 3/1R AOA: ONORBIT: ATO: DEORBIT: LANDING/SAFING: REDUNDANCY SCREENS: A [2] B [F] C [P] LOCATION: PART NUMBER: KBS.DC.SW.AS.AP.CN2 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD JETTISON ANTENNA.

HIGHEST CRITICALITY HDW/FUNC 8/21/87 DATE: 3/1R SUBSYSTEM: MECH/KBD/EPD&C FLIGHT: ABORT: /......... 4603 MDAC ID: +28V CONTACT #2 ITEM: FAILURE MODE: FAILS OPEN SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: A.D. MONTGOMERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM KU-BAND SUBSYSTEM ELECTRICAL 3) 4) DISPLAY AND CONTROLS 5) SWITCHES 6) ARM/SAFE ARM POSITION 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE / RTLS: PRELAUNCH: 1 TAL: LIFTOFF: 3/1R AOA: ONORBIT: ATO: DEORBIT: LANDING/SAFING: REDUNDANCY SCREENS: A [2] B [F] C [P] LOCATION: PART NUMBER: KBS.DC.SW.AS.AP.CN2 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT JETTISON OF THE ANTENNA.

HIGHEST CRITICALITY HDW/FUNC 8/21/87 DATE: 3/1R FLIGHT: SUBSYSTEM: MECH/KBD/EPD&C ABORT: MDAC ID: 4604 +28V CONTACT #3 ITEM: FAILURE MODE: FAILS SHORTED LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) KU-BAND SUBSYSTEM 3) ELECTRICAL 4) DISPLAY AND CONTROLS 5) SWITCHES 6) ARM/SAFE 7) ARM POSITION 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE RTLS: PRELAUNCH: / TAL: LIFTOFF: 3/1R AOA: ONORBIT: ATO: DEORBIT: LANDING/SAFING: REDUNDANCY SCREENS: A [2] B [F] C [P] LOCATION: PART NUMBER: KBS.DC.SW.AS.AP.CN3 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD JETTISON ANTENNA.

HIGHEST CRITICALITY HDW/FUNC 8/21/87 DATE: FLIGHT: 3/1R SUBSYSTEM: MECH/KBD/EPD&C ABORT: MDAC ID: 4605 +28V CONTACT #3 ITEM: FAILURE MODE: FAILS OPEN LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: MECHANICAL ACTUATION SYSTEM KU-BAND SUBSYSTEM 2) ELECTRICAL 3) DISPLAY AND CONTROLS 4) SWITCHES 5) 6) ARM/SAFE ARM POSITION 7) 8) 9) CRITICALITIES HDW/FUNC FLIGHT PHASE HDW/FUNC ABORT RTLS: PRELAUNCH: TAL: LIFTOFF: 3/1R AOA: ONORBIT: ATO: DEORBIT: LANDING/SAFING: REDUNDANCY SCREENS: A [2] B [F] C [P] LOCATION: PART NUMBER: KBS.DC.SW.AS.AP.CN3 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT JETTISON OF THE ANTENNA.

HIGHEST CRITICALITY HDW/FUNC 8/21/87 FLIGHT: 3/1R SUBSYSTEM: MECH/KBD/EPD&C ABORT: MDAC ID: 4606 +28V CONTACT #4 ITEM: FAILS SHORTED FAILURE MODE: LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM KU-BAND SUBSYSTEM 2) 3) ELECTRICAL DISPLAY AND CONTROLS 4) 5) SWITCHES ARM/SAFE 6) 7) ARM POSITION 8) 9) CRITICALITIES HDW/FUNC FLIGHT PHASE HDW/FUNC ABORT PRELAUNCH: RTLS: TAL: LIFTOFF: 3/1R AOA: ONORBIT: ATO: DEORBIT: LANDING/SAFING: B [F] REDUNDANCY SCREENS: A [2] LOCATION: PART NUMBER: KBS.DC.SW.AS.AP.CN4 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: SUBSEQUENT FAILURES COULD JETTISON ANTENNA. NO IMMEDIATE EFFECT.

HIGHEST CRITICALITY HDW/FUNC 8/21/87 DATE: FLIGHT: 3/1R SUBSYSTEM: MECH/KBD/EPD&C ABORT: MDAC ID: 4607 +28V CONTACT #4 ITEM: FAILURE MODE: FAILS OPEN SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: A.D. MONTGOMERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM KU-BAND SUBSYSTEM 3) ELECTRICAL DISPLAY AND CONTROLS 4) 5) SWITCHES 6) ARM/SAFE 7) ARM POSITION 8) 9) CRITICALITIES HDW/FUNC HDW/FUNC ABORT FLIGHT PHASE RTLS: PRELAUNCH: / / TAL: LIFTOFF: ONORBIT: 3/1R AOA: ATO: DEORBIT: LANDING/SAFING: A [2] B [F] C[P] REDUNDANCY SCREENS: LOCATION: PART NUMBER: KBS.DC.SW.AS.AP.CN4 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT JETTISON OF THE ANTENNA.

DATE: 8/21/87 HIGHES SUBSYSTEM: MECH/KBD/EPD&C MDAC ID: 4608	FT CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: /
ITEM: +28V CONTACT #1 FAILURE MODE: FAILS SHORTED	
LEAD ANALYST: A.D. MONTGOMERY SUBSYS	E LEAD: H.J. LOWERY
BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) KU-BAND SUBSYSTEM 3) ELECTRICAL 4) DISPLAY AND CONTROLS 5) SWITCHES 6) ARM/SAFE 7) SAFE POSITION 8) 9)	
CRITICALITIES	
LIFTOFF: / 7	RT HDW/FUNC RTLS: / FAL: / AOA: / ATO: /
REDUNDANCY SCREENS: A [] B [] c[]
LOCATION: PART NUMBER: KBS.DC.SW.AS.SP.CN1	
CAUSES: PIECE-PART STRUCTURAL FAILURE	
EFFECTS/RATIONALE: NO EFFECT.	
REFERENCES:	

DATE: 8/21/87 SUBSYSTEM: MECH/KBD/EPD&C MDAC ID: 4609	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: /
ITEM: +28V CONTACT #1 FAILURE MODE: FAILS OPEN	
LEAD ANALYST: A.D. MONTGOMERY	SUBSYS LEAD: H.J. LOWERY
BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) KU-BAND SUBSYSTEM 3) ELECTRICAL 4) DISPLAY AND CONTROLS 5) SWITCHES 6) ARM/SAFE 7) SAFE POSITION 8) 9)	
CRITICAL	ITIES
FLIGHT PHASE HDW/FUNC PRELAUNCH: / LIFTOFF: / ONORBIT: 3/3 DEORBIT: / LANDING/SAFING: /	ABORT HDW/FUNC RTLS: / TAL: / AOA: / ATO: /
REDUNDANCY SCREENS: A []	3 [] C []
LOCATION: PART NUMBER: KBS.DC.SW.AS.SP.CN1	
CAUSES: PIECE-PART STRUCTURAL FAILU	JRE
EFFECTS/RATIONALE: NO EFFECT.	

DATE: 8/21/87 HI SUBSYSTEM: MECH/KBD/EPD&C MDAC ID: 4610	IGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: /
ITEM: +28V CONTACT #2 FAILURE MODE: FAILS SHORTED	
LEAD ANALYST: A.D. MONTGOMERY SU	UBSYS LEAD: H.J. LOWERY
BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) KU-BAND SUBSYSTEM 3) ELECTRICAL 4) DISPLAY AND CONTROLS 5) SWITCHES 6) ARM/SAFE 7) SAFE POSITION 8) 9)	
CRITICALIT	IES
FLIGHT PHASE HDW/FUNC PRELAUNCH: / LIFTOFF: / ONORBIT: 3/3 DEORBIT: / LANDING/SAFING: /	ABORT HDW/FUNC RTLS: / TAL: / AOA: / ATO: /
REDUNDANCY SCREENS: A [] B	[] c[]
LOCATION: PART NUMBER: KBS.DC.SW.AS.SP.CN2	
CAUSES: PIECE-PART STRUCTURAL FAILUR	E
EFFECTS/RATIONALE: NO EFFECT.	
REFERENCES:	

DATE: 8/21/87 SUBSYSTEM: MECH/KBD/EPD&C MDAC ID: 4611	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: /
ITEM: +28V CONTACT #2 FAILURE MODE: FAILS OPEN	
LEAD ANALYST: A.D. MONTGOMERY	SUBSYS LEAD: H.J. LOWERY
BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) KU-BAND SUBSYSTEM 3) ELECTRICAL 4) DISPLAY AND CONTROLS 5) SWITCHES 6) ARM/SAFE 7) SAFE POSITION 8) 9)	
CRITICAL	ITIES
FLIGHT PHASE HDW/FUNC PRELAUNCH: / LIFTOFF: / ONORBIT: 3/3 DEORBIT: / LANDING/SAFING: /	ABORT HDW/FUNC RTLS: / TAL: / AOA: / ATO: /
REDUNDANCY SCREENS: A []	в[] с[]
LOCATION: PART NUMBER: KBS.DC.SW.AS.SP.CN2	
CAUSES: PIECE-PART STRUCTURAL FAIL	URE
EFFECTS/RATIONALE: NO EFFECT.	

DATE: 8/21/87 SUBSYSTEM: MECH/KBD/EPD&C MDAC ID: 4612	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: /
ITEM: +28V CONTACT #3 FAILURE MODE: FAILS SHORTED	
LEAD ANALYST: A.D. MONTGOMERY	SUBSYS LEAD: H.J. LOWERY
BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) KU-BAND SUBSYSTEM 3) ELECTRICAL 4) DISPLAY AND CONTROLS 5) SWITCHES 6) ARM/SAFE 7) SAFE POSITION 8) 9)	
CRITICAL	
FLIGHT PHASE HDW/FUNC PRELAUNCH: / LIFTOFF: / ONORBIT: 3/3 DEORBIT: / LANDING/SAFING: /	ABORT HDW/FUNC RTLS: / TAL: / AOA: / ATO: /
REDUNDANCY SCREENS: A []	B [] C []
LOCATION: PART NUMBER: KBS.DC.SW.AS.SP.CN3	
CAUSES: PIECE-PART STRUCTURAL FAIR	LURE
EFFECTS/RATIONALE: NO EFFECT.	

DATE: 8/21/87 HIGHEST CRITICALITY HDW/FUNC SUBSYSTEM: MECH/KBD/EPD&C FLIGHT: 3/3 MDAC ID: 4613 ABORT: ITEM: +28V CONTACT #3 FAILURE MODE: FAILS OPEN LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) KU-BAND SUBSYSTEM 3) ELECTRICAL 4) DISPLAY AND CONTROLS 5) SWITCHES ARM/SAFE 6) SAFE POSITION 8) 9) CRITICALITIES FLIGHT PHASE HDW/FUNC ABORT HDW/FUNC / PRELAUNCH: RTLS: LIFTOFF: TAL: 3/3 ONORBIT: AOA: DEORBIT: ATO: LANDING/SAFING: REDUNDANCY SCREENS: A [] B [] C [LOCATION: PART NUMBER: KBS.DC.SW.AS.SP.CN3 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO EFFECT.

DATE: 8/21/87 SUBSYSTEM: MECH/KBD/EPD&C MDAC ID: 4614 ITEM: +28V CONTACT #4 FAILURE MODE: FAILS SHORTED	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: /
LEAD ANALYST: A.D. MONTGOMERY	SUBSYS LEAD: H.J. LOWERY
BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) KU-BAND SUBSYSTEM 3) ELECTRICAL 4) DISPLAY AND CONTROLS 5) SWITCHES 6) ARM/SAFE 7) SAFE POSITION 8) 9)	
CRITICAL	ITIES
FLIGHT PHASE HDW/FUNC PRELAUNCH: / LIFTOFF: / ONORBIT: 3/3 DEORBIT: / LANDING/SAFING: /	ABORT HDW/FUNC RTLS: / TAL: / AOA: / ATO: /
REDUNDANCY SCREENS: A []	в[] с[]
LOCATION: PART NUMBER: KBS.DC.SW.AS.SP.CN4	•
CAUSES: PIECE-PART STRUCTURAL FAIL	URE
EFFECTS/RATIONALE: NO EFFECT.	

DATE: 8/21/87 SÜBSYSTEM: MECH/KBD/EPD&C MDAC ID: 4615	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: /
ITEM: +28V CONTACT #4 FAILURE MODE: FAILS OPEN	
LEAD ANALYST: A.D. MONTGOMERY	SUBSYS LEAD: H.J. LOWERY
BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) KU-BAND SUBSYSTEM 3) ELECTRICAL 4) DISPLAY AND CONTROLS 5) SWITCHES 6) ARM/SAFE 7) SAFE POSITION 8) 9)	
CRITICAL	ITIES
FLIGHT PHASE HDW/FUNC PRELAUNCH: / LIFTOFF: / ONORBIT: 3/3 DEORBIT: / LANDING/SAFING: /	
REDUNDANCY SCREENS: A []	B [] C []
LOCATION: PART NUMBER: KBS.DC.SW.AS.SP.CN4	
CAUSES: PIECE-PART STRUCTURAL FAIL	URE
EFFECTS/RATIONALE: NO EFFECT.	

HIGHEST CRITICALITY HDW/FUNC 8/21/87 DATE: 3/1R FLIGHT: SUBSYSTEM: MECH/KBD/EPD&C ABORT: MDAC ID: 4616 +28V CONTACT #1 ITEM: FAILURE MODE: FAILS SHORTED SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: A.D. MONTGOMERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) KU-BAND SUBSYSTEM 3) ELECTRICAL 4) DISPLAY AND CONTROLS 5) SWITCHES 6) JETTISON/SAFE 7) JETTISON POSITION 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE RTLS: PRELAUNCH: / / TAL: LIFTOFF: 3/1R AOA: ONORBIT: ATO: DEORBIT: LANDING/SAFING: REDUNDANCY SCREENS: A [2] B[F] C[P] LOCATION: PART NUMBER: KBS.DC.SW.JS.JP.CN1 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD JETTISON ANTENNA.

HIGHEST CRITICALITY HDW/FUNC DATE: 8/21/87 SUBSYSTEM: MECH/KBD/EPD&C FLIGHT: 3/1R ABORT: MDAC ID: 4617 +28V CONTACT #1 ITEM: FAILURE MODE: FAILS OPEN LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) KU-BAND SUBSYSTEM 3) ELECTRICAL 4) DISPLAY AND CONTROLS 5) SWITCHES 6) JETTISON/SAFE 7) JETTISON POSITION 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE RTLS: PRELAUNCH: / / LIFTOFF: TAL: 3/1R AOA: ONORBIT: / ATO: DEORBIT: LANDING/SAFING: / REDUNDANCY SCREENS: A [2] B [F] C [P] LOCATION: PART NUMBER: KBS.DC.SW.JS.JP.CN1 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT JETTISON OF THE ANTENNA.

HIGHEST CRITICALITY HDW/FUNC 8/21/87 DATE: FLIGHT: 3/1R SUBSYSTEM: MECH/KBD/EPD&C ABORT: MDAC ID: 4618 ITEM: +28V CONTACT #2 FAILURE MODE: FAILS SHORTED LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: MECHANICAL ACTUATION SYSTEM 2) KU-BAND SUBSYSTEM ELECTRICAL 3) 4) DISPLAY AND CONTROLS 5) SWITCHES 6) JETTISON/SAFE JETTISON POSITION 7) 8) 9) CRITICALITIES HDW/FUNC FLIGHT PHASE HDW/FUNC ABORT RTLS: PRELAUNCH: / TAL: LIFTOFF: 3/1R AOA: ONORBIT: ATO: DEORBIT: / LANDING/SAFING: REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:

PART NUMBER: KBS.DC.SW.JS.JP.CN2

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD JETTISON ANTENNA.

HIGHEST CRITICALITY HDW/FUNC 8/21/87 DATE: SUBSYSTEM: MECH/KBD/EPD&C FLIGHT: 3/1R ABORT: MDAC ID: 4619 +28V CONTACT #2 ITEM: FAILURE MODE: FAILS OPEN LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) KU-BAND SUBSYSTEM 3) ELECTRICAL DISPLAY AND CONTROLS 4) SWITCHES 5) JETTISON/SAFE JETTISON POSITION 7) 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE RTLS: PRELAUNCH: / TAL: LIFTOFF: 3/1R AOA: ONORBIT: ATO: DEORBIT: LANDING/SAFING: REDUNDANCY SCREENS: A [2] B [F] C [P] LOCATION: PART NUMBER: KBS.DC.SW.JS.JP.CN2 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT JETTISON OF THE ANTENNA.

DATE: 8/21/87 SUBSYSTEM: MECH/KBD/EPD&C MDAC ID: 4620	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: /
ITEM: +28V CONTACT #1 FAILURE MODE: FAILS SHORTED	
LEAD ANALYST: A.D. MONTGOMERY	SUBSYS LEAD: H.J. LOWERY
BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) KU-BAND SUBSYSTEM 3) ELECTRICAL 4) DISPLAY AND CONTROLS 5) SWITCHES 6) JETTISON/SAFE 7) SAFE POSITION 8) 9)	
CRITICAL	ITIES
FLIGHT PHASE HDW/FUNC PRELAUNCH: / LIFTOFF: / ONORBIT: 3/3 DEORBIT: / LANDING/SAFING: /	ABORT HDW/FUNC RTLS: / TAL: / AOA: / ATO: /
REDUNDANCY SCREENS: A []	B [] C []
LOCATION: PART NUMBER: KBS.DC.SW.JS.SP.CN1	
CAUSES: PIECE-PART STRUCTURAL FAIL	URE .
EFFECTS/RATIONALE: NO EFFECT.	

HIGHEST CRITICALITY HDW/FUNC 8/21/87 DATE: FLIGHT: 3/3-SUBSYSTEM: MECH/KBD/EPD&C ABORT: 4621 MDAC ID: +28V CONTACT #1 ITEM: FAILURE MODE: FAILS OPEN LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM KU-BAND SUBSYSTEM 3) ELECTRICAL 4) DISPLAY AND CONTROLS **SWITCHES** 5) 6) JETTISON/SAFE SAFE POSITION 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE RTLS: PRELAUNCH: / / TAL: LIFTOFF: 3/3 AOA: ONORBIT: ATO: DEORBIT: LANDING/SAFING: REDUNDANCY SCREENS: A [] B [] C [LOCATION: PART NUMBER: KBS.DC.SW.JS.SP.CN1 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO EFFECT.

DATE: 8/21/87 SUBSYSTEM: MECH/KBD/EPD&C MDAC ID: 4622	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: /
ITEM: +28V CONTACT #2 FAILURE MODE: FAILS SHORTED	
LEAD ANALYST: A.D. MONTGOMERY	SUBSYS LEAD: H.J. LOWERY
BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) KU-BAND SUBSYSTEM 3) ELECTRICAL 4) DISPLAY AND CONTROLS 5) SWITCHES 6) JETTISON/SAFE 7) SAFE POSITION 8) 9)	
CRITICA	LITIES
FLIGHT PHASE HDW/FUNC PRELAUNCH: / LIFTOFF: / ONORBIT: 3/3 DEORBIT: / LANDING/SAFING: /	ABORT HDW/FUNC RTLS: / TAL: / AOA: / ATO: /
REDUNDANCY SCREENS: A []	B [] C []
LOCATION: PART NUMBER: KBS.DC.SW.JS.SP.CN2	
CAUSES: PIECE-PART STRUCTURAL FAI	LURE
EFFECTS/RATIONALE: NO EFFECT.	
REFERENCES:	

DATE: 8/21/87 SUBSYSTEM: MECH/KBD/EPD&C MDAC ID: 4623	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: /
ITEM: +28V CONTACT #2 FAILURE MODE: FAILS OPEN	
LEAD ANALYST: A.D. MONTGOMERY	SUBSYS LEAD: H.J. LOWERY
BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) KU-BAND SUBSYSTEM 3) ELECTRICAL 4) DISPLAY AND CONTROLS 5) SWITCHES 6) JETTISON/SAFE 7) SAFE POSITION 8) 9)	
CRITICAL	ITIES
	ABORT HDW/FUNC RTLS: / TAL: / AOA: / ATO: /
REDUNDANCY SCREENS: A []	в[] с[]
LOCATION: PART NUMBER: KBS.DC.SW.JS.SP.CN2	
CAUSES: PIECE-PART STRUCTURAL FAIL	URE
EFFECTS/RATIONALE: NO EFFECT.	

HIGHEST CRITICALITY HDW/FUNC DATE: 8/21/87 3/1R FLIGHT: SUBSYSTEM: MECH/KBD/EPD&C ABORT: MDAC ID: ITEM: AND GATE #1 FAILURE MODE: FAILS SHORTED SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: A.D. MONTGOMERY BREAKDOWN HIERARCHY: MECHANICAL ACTUATION SYSTEM 2) KU-BAND SUBSYSTEM ELECTRICAL 3) 4) LCA1 5) 6) 7) 8) 9) CRITICALITIES HDW/FUNC FLIGHT PHASE HDW/FUNC ABORT RTLS: PRELAUNCH: TAL: LIFTOFF: AOA: 3/1R ONORBIT: ATO: DEORBIT: LANDING/SAFING: B [F] C [P] REDUNDANCY SCREENS: A [2] LOCATION: PART NUMBER: KBS.LC1.AG1 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD JETTISON THE ANTENNA.

DATE: 8/21/87 HIGHEST CRITICALITY HDW/FUNC SUBSYSTEM: MECH/KBD/EPD&C FLIGHT: 3/1R ABORT: MDAC ID: 4625 ITEM: AND GATE #1 FAILURE MODE: FAILS OPEN LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) KU-BAND SUBSYSTEM 3) ELECTRICAL 4) LCA1 5)

CRITICALITIES

FLIGHT PHASE HDW/FUNC ABORT HDW/FUNC RTLS: / / PRELAUNCH: LIFTOFF: TAL: 3/1R ONORBIT: AOA: DEORBIT: ATO: LANDING/SAFING:

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:

6) 7) 8) 9)

PART NUMBER: KBS.LC1.AG1

CAUSES: PIECE-PART STRUCTURAL FAILURE

EFFECTS/RATIONALE:

NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT JETTISON

OF THE ANTENNA.

HIGHEST CRITICALITY HDW/FUNC 8/21/87 DATE: 3/1R FLIGHT: SUBSYSTEM: MECH/KBD/EPD&C ABORT: MDAC ID: 4626 AND GATE #2 ITEM: FAILURE MODE: FAILS SHORTED SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: A.D. MONTGOMERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM KU-BAND SUBSYSTEM 3) ELECTRICAL LCA1 4) 5) 6) 7) 8) 9) CRITICALITIES HDW/FUNC HDW/FUNC ABORT FLIGHT PHASE RTLS: PRELAUNCH: / TAL: LIFTOFF: 3/1R AOA: ONORBIT: ATO: DEORBIT: LANDING/SAFING: A[2] B[F] C[P] REDUNDANCY SCREENS: LOCATION: PART NUMBER: KBS.LC1.AG2 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD JETTISON THE ANTENNA.

HIGHEST CRITICALITY HDW/FUNC DATE: 8/21/87 SUBSYSTEM: MECH/KBD/EPD&C FLIGHT: 3/1R ABORT: MDAC ID: 4627 AND GATE #2 ITEM: FAILURE MODE: FAILS OPEN LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) KU-BAND SUBSYSTEM 3) ELECTRICAL 4) LCA1 5) 6) 7) 8) 9) CRITICALITIES FLIGHT PHASE HDW/FUNC ABORT HDW/FUNC / PRELAUNCH: RTLS: / TAL: LIFTOFF: 3/1R ONORBIT: AOA: DEORBIT: ATO: LANDING/SAFING: REDUNDANCY SCREENS: A [2] B [F] C [P] LOCATION: PART NUMBER: KBS.LC1.AG2 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT JETTISON OF THE ANTENNA.

HIGHEST CRITICALITY HDW/FUNC 8/21/87 DATE: FLIGHT: 3/1R SUBSYSTEM: MECH/KBD/EPD&C ABORT: 4628 MDAC ID: 40 MS TIME DELAY ITEM: FAILURE MODE: FAILS SHORTED SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: A.D. MONTGOMERY BREAKDOWN HIERARCHY: MECHANICAL ACTUATION SYSTEM KU-BAND SUBSYSTEM 3) ELECTRICAL LCA1 4) 5) 6) 7) 8) 9) CRITICALITIES ABORT HDW/FUNC FLIGHT PHASE HDW/FUNC PRELAUNCH: RTLS: / LIFTOFF: TAL: 3/1R AOA: ONORBIT: ATO: DEORBIT: LANDING/SAFING: REDUNDANCY SCREENS: A [2] B [F] C [P] LOCATION: PART NUMBER: KBS.LC1.MTD CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD JETTISON THE ANTENNA.

HIGHEST CRITICALITY HDW/FUNC 8/21/87 DATE: FLIGHT: 3/1R SUBSYSTEM: MECH/KBD/EPD&C ABORT: 4629 MDAC ID: 40 MS TIME DELAY ITEM: FAILURE MODE: FAILS OPEN SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: A.D. MONTGOMERY BREAKDOWN HIERARCHY: MECHANICAL ACTUATION SYSTEM 1) KU-BAND SUBSYSTEM 2) ELECTRICAL 3) 4) LCA1 5) 6) 7) 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE RTLS: / PRELAUNCH: / TAL: LIFTOFF: 3/1R ONORBIT: AOA: DEORBIT: ATO: LANDING/SAFING: REDUNDANCY SCREENS: A [2] B [F] C [P] LOCATION: PART NUMBER: KBS.LC1.MTD CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT JETTISON OF THE ANTENNA.

HIGHEST CRITICALITY HDW/FUNC 8/21/87 DATE: 3/1R FLIGHT: SUBSYSTEM: MECH/KBD/EPD&C ABORT: 4630 MDAC ID: ' AMP #1 ITEM: FAILURE MODE: FAILS SHORTED SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: A.D. MONTGOMERY BREAKDOWN HIERARCHY: MECHANICAL ACTUATION SYSTEM KU-BAND SUBSYSTEM 3) ELECTRICAL 4) LCA1 5) 6) 7) 8) 9) CRITICALITIES HDW/FUNC HDW/FUNC ABORT FLIGHT PHASE RTLS: PRELAUNCH: TAL: LIFTOFF: 3/1R AOA: ONORBIT: ATO: DEORBIT: LANDING/SAFING: REDUNDANCY SCREENS: A [2] B [F] C [P] LOCATION: PART NUMBER: KBS.LC1.AM1 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD JETTISON THE ANTENNA.

HIGHEST CRITICALITY HDW/FUNC 8/21/87 DATE: FLIGHT: 3/1R SUBSYSTEM: MECH/KBD/EPD&C ABORT: MDAC ID: 4631 ITEM: AMP #1 FAILURE MODE: FAILS OPEN SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: A.D. MONTGOMERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) KU-BAND SUBSYSTEM 3) ELECTRICAL LCA1 4) 5) 6) 7) 8) 9) CRITICALITIES FLIGHT PHASE ABORT HDW/FUNC HDW/FUNC PRELAUNCH: RTLS: TAL: LIFTOFF: AOA: ONORBIT: 3/1R ATO: DEORBIT: LANDING/SAFING: C [P] REDUNDANCY SCREENS: A [2] B [F] LOCATION: PART NUMBER: KBS.LC1.AM1 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT JETTISON OF THE ANTENNA. REFERENCES:

HIGHEST CRITICALITY HDW/FUNC 8/21/87 DATE: FLIGHT: 3/1R SUBSYSTEM: MECH/KBD/EPD&C ABORT: 4632 MDAC ID: ITEM: AND GATE #3 FAILURE MODE: FAILS SHORTED SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: A.D. MONTGOMERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) KU-BAND SUBSYSTEM 3) ELECTRICAL LCA1 4) 5) 6) 7) 8) 9) CRITICALITIES ABORT HDW/FUNC FLIGHT PHASE HDW/FUNC RTLS: / PRELAUNCH: TAL: LIFTOFF: 3/1R AOA: ONORBIT: ATO: DEORBIT: LANDING/SAFING: REDUNDANCY SCREENS: A [2] B [F] C [P] LOCATION: PART NUMBER: KBS.LC1.AG3 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD JETTISON THE ANTENNA.

HIGHEST CRITICALITY HDW/FUNC DATE: 8/21/87 FLIGHT: 3/1R SUBSYSTEM: MECH/KBD/EPD&C ABORT: MDAC ID: 4633 ITEM: AND GATE #3 FAILURE MODE: FAILS OPEN LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: MECHANICAL ACTUATION SYSTEM 2) KU-BAND SUBSYSTEM 3) ELECTRICAL LCA1 4) 5) 6) 7) 8) 9) CRITICALITIES ABORT HDW/FUNC FLIGHT PHASE HDW/FUNC / / RTLS: PRELAUNCH: TAL: LIFTOFF: 3/1R AOA: ONORBIT: ATO: DEORBIT: LANDING/SAFING: REDUNDANCY SCREENS: A [2] B [F] C [P] LOCATION: PART NUMBER: KBS.LC1.AG3 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT JETTISON OF THE ANTENNA. REFERENCES:

HIGHEST CRITICALITY HDW/FUNC DATE: 8/21/87 SUBSYSTEM: MECH/KBD/EPD&C FLIGHT: 3/1R ABORT: / MDAC ID: 4634 4 SECOND TIME DELAY ITEM: FAILURE MODE: FAILS SHORTED SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: A.D. MONTGOMERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM KU-BAND SUBSYSTEM 2) ELECTRICAL 3) 4) LCA1 5) 6) 7) 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE RTLS: / PRELAUNCH: LIFTOFF: TAL: 3/1R AOA: ONORBIT: ATO: DEORBIT: LANDING/SAFING: REDUNDANCY SCREENS: A [2] B [F] C [P] LOCATION: PART NUMBER: KBS.LC1.STD CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD JETTISON THE ANTENNA.

HIGHEST CRITICALITY HDW/FUNC DATE: 8/21/87 FLIGHT: 3/1R SUBSYSTEM: MECH/KBD/EPD&C ABORT: MDAC ID: 4 SECOND TIME DELAY ITEM: FAILURE MODE: FAILS OPEN SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: A.D. MONTGOMERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) KU-BAND SUBSYSTEM 3) ELECTRICAL 4) LCA1 5) 6) 7) 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE RTLS: PRELAUNCH: / TAL: LIFTOFF: AOA: 3/1R ONORBIT: ATO: DEORBIT: / LANDING/SAFING: REDUNDANCY SCREENS: A [2] B [F] C [P] LOCATION: PART NUMBER: KBS.LC1.STD CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT JETTISON OF THE ANTENNA.

HIGHEST CRITICALITY HDW/FUNC 8/21/87 DATE: 3/1R FLIGHT: SUBSYSTEM: MECH/KBD/EPD&C ABORT: MDAC ID: ITEM: AMP #3 FAILURE MODE: FAILS SHORTED LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: MECHANICAL ACTUATION SYSTEM 2) KU-BAND SUBSYSTEM ELECTRICAL 3) LCA1 4) 5) 6) 7) 8) 9) CRITICALITIES HDW/FUNC FLIGHT PHASE HDW/FUNC ABORT RTLS: PRELAUNCH: TAL: LIFTOFF: 3/1R AOA: ONORBIT: ATO: DEORBIT: LANDING/SAFING: REDUNDANCY SCREENS: A [2] B [F] C [P] LOCATION: PART NUMBER: KBS.LC1.AM3 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD JETTISON THE ANTENNA.

HIGHEST CRITICALITY HDW/FUNC 8/21/87 DATE: FLIGHT: 3/1R SUBSYSTEM: MECH/KBD/EPD&C ABORT: MDAC ID: 4637 AMP #3 ITEM: FAILURE MODE: FAILS OPEN LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM KU-BAND SUBSYSTEM 2) ELECTRICAL 3) 4) LCA1 5) 6) 7) 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE RTLS: PRELAUNCH: / TAL: LIFTOFF: 3/1R AOA: ONORBIT: ATO: DEORBIT: LANDING/SAFING: B [F] C [P] REDUNDANCY SCREENS: A [2] LOCATION: PART NUMBER: KBS.LC1.AM3 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT JETTISON OF THE ANTENNA.

HIGHEST CRITICALITY HDW/FUNC DATE: 8/21/87 SUBSYSTEM: MECH/KBD/EPD&C FLIGHT: 3/1R ABORT: / MDAC ID: 4638 EXPLOSIVE INITIATOR ITEM: FAILURE MODE: FAILS SHORTED LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM KU-BAND SUBSYSTEM 2) ELECTRICAL 3) 4) LCA1 5) GUILLOTINE PIC 6) 7) 8) 9) CRITICALITIES HDW/FUNC HDW/FUNC ABORT FLIGHT PHASE / RTLS: PRELAUNCH: LIFTOFF: TAL: 3/1R AOA: ONORBIT: ATO: DEORBIT: LANDING/SAFING: REDUNDANCY SCREENS: A [2] B [F] C [P] LOCATION: PART NUMBER: KBS.LC1.GP.EI CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD JETTISON THE ANTENNA.

HIGHEST CRITICALITY HDW/FUNC 8/21/87 DATE: 3/1R FLIGHT: SUBSYSTEM: MECH/KBD/EPD&C ABORT: MDAC ID: 4639 ITEM: EXPLOSIVE INITIATOR FAILURE MODE: FAILS OPEN LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: MECHANICAL ACTUATION SYSTEM KU-BAND SUBSYSTEM 2) ELECTRICAL 3) 4) LCA1 5) GUILLOTINE PIC 6) 7) 8) 9) CRITICALITIES ABORT FLIGHT PHASE HDW/FUNC HDW/FUNC RTLS: PRELAUNCH: TAL: LIFTOFF: 3/1R AOA: ONORBIT: / DEORBIT: ATO: LANDING/SAFING: REDUNDANCY SCREENS: A [2] B [F] C [P] LOCATION: PART NUMBER: KBS.LC1.GP.EI CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT JETTISON OF THE ANTENNA.

HIGHEST CRITICALITY HDW/FUNC 8/21/87 DATE: 3/1R SUBSYSTEM: MECH/KBD/EPD&C FLIGHT: ABORT: 4640 MDAC ID: EXPLOSIVE INITIATOR ITEM: FAILURE MODE: FAILS SHORTED SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: A.D. MONTGOMERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) KU-BAND SUBSYSTEM 3) ELECTRICAL LCA1 4) NUT PIC 5) 6) 7) 8) 9) CRITICALITIES HDW/FUNC FLIGHT PHASE HDW/FUNC ABORT RTLS: PRELAUNCH: / TAL: LIFTOFF: 3/1R ONORBIT: AOA: ATO: DEORBIT: LANDING/SAFING: REDUNDANCY SCREENS: A [2] B [F] C [P] LOCATION: PART NUMBER: KBS.LC1.NP.EI CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD JETTISON THE ANTENNA.

HIGHEST CRITICALITY HDW/FUNC 8/21/87 DATE: 3/1R SUBSYSTEM: MECH/KBD/EPD&C FLIGHT: MDAC ID: ABORT: / 4641 EXPLOSIVE INITIATOR ITEM: FAILURE MODE: FAILS OPEN LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM KU-BAND SUBSYSTEM 2) 3) ELECTRICAL 4) LCA1 NUT PIC 5) 6) 7) 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE PRELAUNCH: RTLS: / TAL: LIFTOFF: 3/1R AOA: ONORBIT: ATO: DEORBIT: LANDING/SAFING: REDUNDANCY SCREENS: A [2] B[F] C[P] LOCATION: PART NUMBER: KBS.LC1.NP.EI CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT JETTISON OF THE ANTENNA.

HIGHEST CRITICALITY HDW/FUNC 8/21/87 DATE: FLIGHT: 3/1R SUBSYSTEM: MECH/KBD/EPD&C ABORT: MDAC ID: 4642 ITEM: AND GATE #1 FAILURE MODE: FAILS SHORTED SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: A.D. MONTGOMERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) KU-BAND SUBSYSTEM 3) ELECTRICAL LCA3 4) 5) 6) 7) 8) 9) CRITICALITIES HDW/FUNC FLIGHT PHASE HDW/FUNC ABORT RTLS: PRELAUNCH: / TAL: LIFTOFF: 3/1R AOA: ONORBIT: ATO: DEORBIT: LANDING/SAFING: REDUNDANCY SCREENS: A [2] B [F] C [P] LOCATION: PART NUMBER: KBS.LC1.AG1 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD JETTISON THE ANTENNA.

REPORT DATE 11/25/87

HIGHEST CRITICALITY HDW/FUNC DATE: 8/21/87 FLIGHT: 3/1R SUBSYSTEM: MECH/KBD/EPD&C ABORT: MDAC ID: AND GATE #1 ITEM: FAILURE MODE: FAILS OPEN LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) KU-BAND SUBSYSTEM 3) ELECTRICAL LCA3 4) 5) 6) 7) 8) 9) CRITICALITIES FLIGHT PHASE ABORT HDW/FUNC HDW/FUNC PRELAUNCH: RTLS: TAL: LIFTOFF: 3/1R AOA: ONORBIT: ATO: DEORBIT: LANDING/SAFING: REDUNDANCY SCREENS: A [2] B [F] C [P] LOCATION: PART NUMBER: KBS.LC1.AG1 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT JETTISON OF THE ANTENNA.

HIGHEST CRITICALITY HDW/FUNC 8/21/87 DATE: SUBSYSTEM: MECH/KBD/EPD&C FLIGHT: 3/1R ABORT: 4644 MDAC ID: ITEM: AND GATE #2 FAILURE MODE: FAILS SHORTED LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) KU-BAND SUBSYSTEM 3) ELECTRICAL LCA3 4) 5) 6) 7) 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE / RTLS: / PRELAUNCH: TAL: LIFTOFF: AOA: 3/1R ONORBIT: / . ATO: DEORBIT: LANDING/SAFING: REDUNDANCY SCREENS: A [2] B [F] C [P] LOCATION: PART NUMBER: KBS.LC1.AG2 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD JETTISON THE ANTENNA.

HIGHEST CRITICALITY HDW/FUNC 8/21/87 DATE: FLIGHT: 3/1R SUBSYSTEM: MECH/KBD/EPD&C ABORT: MDAC ID: 4645 AND GATE #2 ITEM: FAILURE MODE: FAILS OPEN SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: A.D. MONTGOMERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM KU-BAND SUBSYSTEM 2) 3) ELECTRICAL LCA3 4) 5) 6) 7) 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE RTLS: PRELAUNCH: / / TAL: LIFTOFF: 3/1R ONORBIT: AOA: DEORBIT: ATO: LANDING/SAFING: B [F] C [P] REDUNDANCY SCREENS: A [2] LOCATION: PART NUMBER: KBS.LC1.AG2 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT JETTISON OF THE ANTENNA.

HIGHEST CRITICALITY HDW/FUNC 8/21/87 DATE: 3/1R FLIGHT: SUBSYSTEM: MECH/KBD/EPD&C ABORT: MDAC ID: 40 MS TIME DELAY ITEM: FAILURE MODE: FAILS SHORTED SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: A.D. MONTGOMERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) KU-BAND SUBSYSTEM 3) ELECTRICAL LCA3 4) 5) 6) 7) 8) 9) CRITICALITIES FLIGHT PHASE HDW/FUNC HDW/FUNC ABORT RTLS: PRELAUNCH: TAL: LIFTOFF: 3/1R AOA: ONORBIT: ATO: DEORBIT: LANDING/SAFING: REDUNDANCY SCREENS: A [2] B [F] C [P] LOCATION: PART NUMBER: KBS.LC3.MTD CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD JETTISON THE ANTENNA.

8/21/87 HIGHEST CRITICALITY HDW/FUNC DATE: FLIGHT: 3/1R SUBSYSTEM: MECH/KBD/EPD&C ABORT: 4647 MDAC ID: 40 MS TIME DELAY ITEM: FAILURE MODE: FAILS OPEN SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: A.D. MONTGOMERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) KU-BAND SUBSYSTEM 3) ELECTRICAL LCA3 4) 5) 6) 7) 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE RTLS: PRELAUNCH: / LIFTOFF: TAL: 3/1R AOA: ONORBIT: ATO: DEORBIT: LANDING/SAFING: B [F] C [P] REDUNDANCY SCREENS: A [2] LOCATION: PART NUMBER: KBS.LC3.MTD CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT JETTISON OF THE ANTENNA.

HIGHEST CRITICALITY HDW/FUNC 8/21/87 DATE: FLIGHT: 3/1R SUBSYSTEM: MECH/KBD/EPD&C ABORT: 4648 MDAC ID: AMP #1 ITEM: FAILURE MODE: FAILS SHORTED SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: A.D. MONTGOMERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) KU-BAND SUBSYSTEM 3) ELECTRICAL 4) LCA3 5) 6) 7) 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE / RTLS: PRELAUNCH: / TAL: LIFTOFF: 3/1R AOA: ONORBIT: ATO: DEORBIT: LANDING/SAFING: REDUNDANCY SCREENS: A [2] B [F] C [P] LOCATION: PART NUMBER: KBS.LC3.AM1 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD JETTISON THE ANTENNA.

HIGHEST CRITICALITY HDW/FUNC DATE: 8/21/87 FLIGHT: SUBSYSTEM: MECH/KBD/EPD&C 3/1R 4649 ABORT: / MDAC ID: AMP #1 ITEM: FAILURE MODE: FAILS OPEN SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: A.D. MONTGOMERY BREAKDOWN HIERARCHY: MECHANICAL ACTUATION SYSTEM KU-BAND SUBSYSTEM 2) 3) ELECTRICAL LCA3 4) 5) 6) 7) 8) 9) CRITICALITIES ABORT HDW/FUNC HDW/FUNC FLIGHT PHASE RTLS: PRELAUNCH: TAL: LIFTOFF: 3/1R AOA: ONORBIT: ATO: DEORBIT: LANDING/SAFING: B[F] C[P] REDUNDANCY SCREENS: A [2] LOCATION: PART NUMBER: KBS.LC3.AM1 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT JETTISON OF THE ANTENNA. REFERENCES:

HIGHEST CRITICALITY HDW/FUNC DATE: 8/21/87 3/1R FLIGHT: SUBSYSTEM: MECH/KBD/EPD&C ABORT: / 4650 MDAC ID: AND GATE #3 ITEM: FAILURE MODE: FAILS SHORTED SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: A.D. MONTGOMERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM KU-BAND SUBSYSTEM 2) 3) ELECTRICAL 4) LCA3 5) 6) 7) 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE /. RTLS: PRELAUNCH: TAL: LIFTOFF: 3/1R AOA: ONORBIT: ATO: DEORBIT: / LANDING/SAFING: / REDUNDANCY SCREENS: A [2] B [F] C [P] LOCATION: PART NUMBER: KBS.LC3.AG3 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD JETTISON THE ANTENNA.

HIGHEST CRITICALITY HDW/FUNC 8/21/87 DATE: 3/1R SUBSYSTEM: MECH/KBD/EPD&C FLIGHT: MDAC ID: 4651 ABORT: ITEM: AND GATE #3 FAILURE MODE: FAILS OPEN LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) KU-BAND SUBSYSTEM 3) ELECTRICAL 4) LCA3 5) 6) 7) 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE PRELAUNCH: / RTLS: TAL: LIFTOFF: 3/1R AOA: ONORBIT: ATO: DEORBIT: LANDING/SAFING: / REDUNDANCY SCREENS: A [2] B [F] C [P] LOCATION: PART NUMBER: KBS.LC3.AG3 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT JETTISON OF THE ANTENNA.

HIGHEST CRITICALITY HDW/FUNC DATE: 8/21/87 SUBSYSTEM: MECH/KBD/EPD&C FLIGHT: 3/1R ABORT: MDAC ID: 4652 4 SECOND TIME DELAY ITEM: FAILURE MODE: FAILS SHORTED LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) KU-BAND SUBSYSTEM 3) ELECTRICAL 4) LCA3 5) 6) 7) 8) 9) CRITICALITIES HDW/FUNC FLIGHT PHASE HDW/FUNC ABORT PRELAUNCH: RTLS: / / LIFTOFF: TAL: 3/1R ONORBIT: AOA: DEORBIT: ATO: LANDING/SAFING: REDUNDANCY SCREENS: A [2] B [F] C [P] LOCATION: PART NUMBER: KBS.LC3.STD CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD JETTISON THE ANTENNA.

HIGHEST CRITICALITY HDW/FUNC 8/21/87 DATE: 3/1R SUBSYSTEM: MECH/KBD/EPD&C FLIGHT: ABORT: MDAC ID: 4653 ITEM: 4 SECOND TIME DELAY FAILURE MODE: FAILS ON LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) KU-BAND SUBSYSTEM 3) ELECTRICAL LCA3 4) 5) 6) 7) 8) 9) CRITICALITIES HDW/FUNC FLIGHT PHASE HDW/FUNC ABORT PRELAUNCH: 1 RTLS: TAL: LIFTOFF: 3/1R AOA: ONORBIT: ATO: DEORBIT: LANDING/SAFING: REDUNDANCY SCREENS: A [2] B [F] C [P] LOCATION: PART NUMBER: KBS.LC3.STD CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT JETTISON OF THE ANTENNA.

HIGHEST CRITICALITY HDW/FUNC 8/21/87 DATE: 3/1R SUBSYSTEM: MECH/KBD/EPD&C FLIGHT: ABORT: MDAC ID: 4654 ITEM: AMP #3 FAILURE MODE: FAILS SHORTED LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: MECHANICAL ACTUATION SYSTEM 2) KU-BAND SUBSYSTEM ELECTRICAL 3) 4) LCA3 5) 6) 7) 8) 9) CRITICALITIES FLIGHT PHASE HDW/FUNC ABORT HDW/FUNC RTLS: PRELAUNCH: TAL: LIFTOFF: 3/1R AOA: ONORBIT: ATO: DEORBIT: LANDING/SAFING: B [F] C [P] REDUNDANCY SCREENS: A [2] LOCATION: PART NUMBER: KBS.LC3.AM3 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD JETTISON THE ANTENNA.

HIGHEST CRITICALITY HDW/FUNC DATE: 8/21/87 FLIGHT: 3/1R SUBSYSTEM: MECH/KBD/EPD&C ABORT: MDAC ID: 4655 AMP #3 ITEM: FAILURE MODE: FAILS OPEN LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) KU-BAND SUBSYSTEM 3) ELECTRICAL LCA3 4) 5) 6) 7) 8) 9) CRITICALITIES HDW/FUNC FLIGHT PHASE HDW/FUNC ABORT RTLS: PRELAUNCH: / / LIFTOFF: TAL: ONORBIT: 3/1R AOA: DEORBIT: ATO: LANDING/SAFING: B [F] C [P] REDUNDANCY SCREENS: A [2] LOCATION: PART NUMBER: KBS.LC3.AM3 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT JETTISON OF THE ANTENNA.

DATE: 8/21/87 HIGHEST CRITICALITY HDW/FUNC SUBSYSTEM: MECH/KBD/EPD&C 3/1R FLIGHT: MDAC ID: 4656 ABORT: ITEM: EXPLOSIVE INITIATOR FAILURE MODE: FAILS SHORTED LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) KU-BAND SUBSYSTEM ELECTRICAL 3) 4) LCA3 5) GUILLOTINE PIC 6) 7) 8) 9) CRITICALITIES FLIGHT PHASE HDW/FUNC ABORT HDW/FUNC PRELAUNCH: RTLS: LIFTOFF: TAL: 3/1R ONORBIT: AOA: DEORBIT: ATO: LANDING/SAFING: REDUNDANCY SCREENS: A [2] B [F] C [P] LOCATION: PART NUMBER: KBS.LC3.GP.EI CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD JETTISON THE ANTENNA.

HIGHEST CRITICALITY HDW/FUNC DATE: 8/21/87 3/1R FLIGHT: SUBSYSTEM: MECH/KBD/EPD&C ABORT: / MDAC ID: 4657 EXPLOSIVE INITIATOR ITEM: FAILURE MODE: FAILS OPEN LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) KU-BAND SUBSYSTEM 3) ELECTRICAL 4) LCA3 5) GUILLOTINE PIC 6) 7) 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE RTLS: TAL: AOA: / PRELAUNCH: LIFTOFF: 3/1R ONORBIT: ATO: DEORBIT: LANDING/SAFING: REDUNDANCY SCREENS: A [2] B [F] C [P] LOCATION: PART NUMBER: KBS.LC3.GP.EI CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT JETTISON OF THE ANTENNA.

HIGHEST CRITICALITY HDW/FUNC 8/21/87 DATE: 3/1R FLIGHT: SUBSYSTEM: MECH/KBD/EPD&C ABORT: MDAC ID: EXPLOSIVE INITIATOR ITEM: FAILURE MODE: FAILS SHORTED SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: A.D. MONTGOMERY BREAKDOWN HIERARCHY: MECHANICAL ACTUATION SYSTEM 2) KU-BAND SUBSYSTEM 3) ELECTRICAL LCA3 4) NUT PIC 5) 6) 7) 8) 9) CRITICALITIES ABORT HDW/FUNC FLIGHT PHASE HDW/FUNC RTLS: PRELAUNCH: / TAL: LIFTOFF: 3/1R AOA: ONORBIT: ATO: DEORBIT: LANDING/SAFING: REDUNDANCY SCREENS: A [2] B [F] C [P] LOCATION: PART NUMBER: KBS.LC3.NP.EI CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD JETTISON THE ANTENNA.

HIGHEST CRITICALITY HDW/FUNC DATE: 8/21/87 FLIGHT: 3/1R SUBSYSTEM: MECH/KBD/EPD&C ABORT: 4659 MDAC ID: EXPLOSIVE INITIATOR ITEM: FAILURE MODE: FAILS OPEN LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM KU-BAND SUBSYSTEM 3) ELECTRICAL 4) LCA3 NUT PIC 5) 6) 7) 8) 9) CRITICALITIES HDW/FUNC ABORT FLIGHT PHASE HDW/FUNC RTLS: PRELAUNCH: / TAL: LIFTOFF: 3/1R AOA: ONORBIT: / ATO: DEORBIT: LANDING/SAFING: REDUNDANCY SCREENS: A [2] B [F] C [P] LOCATION: PART NUMBER: KBS.LC3.NP.EI CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT JETTISON OF THE ANTENNA.

HIGHEST CRITICALITY HDW/FUNC 8/21/87 DATE: FLIGHT: 3/1R SUBSYSTEM: MECH/KBD/EPD&C ABORT: MDAC ID: 4660 ITEM: AMP #2 FAILURE MODE: FAILS SHORTED SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: A.D. MONTGOMERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM KU-BAND SUBSYSTEM 2) ELECTRICAL 3) LCA1 4) 5) 6) 7) 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE RTLS: / PRELAUNCH: TAL: LIFTOFF: 3/1R AOA: ONORBIT: ATO: DEORBIT: LANDING/SAFING: REDUNDANCY SCREENS: A [2] B [F] C [P] LOCATION: PART NUMBER: KBS.LC3.AM2 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD JETTISON THE ANTENNA.

HIGHEST CRITICALITY HDW/FUNC 8/21/87 DATE: SUBSYSTEM: MECH/KBD/EPD&C FLIGHT: 3/1R ABORT: MDAC ID: 4661 ITEM: AMP #2 FAILURE MODE: FAILS OPEN LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: MECHANICAL ACTUATION SYSTEM 1) KU-BAND SUBSYSTEM 2) ELECTRICAL 3) LCA1 4) 5) 6) 7) 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE RTLS: PRELAUNCH: / LIFTOFF: TAL: 3/1R ONORBIT: AOA: ATO: DEORBIT: LANDING/SAFING: B[F] C[P] A [2] REDUNDANCY SCREENS: LOCATION: PART NUMBER: KBS.LC3.AM2 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT JETTISON OF THE ANTENNA.

HIGHEST CRITICALITY HDW/FUNC 8/21/87 DATE: FLIGHT: 3/1R SUBSYSTEM: MECH/KBD/EPD&C ABORT: MDAC ID: 4662 ITEM: AMP #2 FAILURE MODE: FAILS SHORTED SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: A.D. MONTGOMERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) KU-BAND SUBSYSTEM ELECTRICAL 3) LCA3 4) 5) 6) 7) 8) 9) CRITICALITIES HDW/FUNC FLIGHT PHASE HDW/FUNC ABORT RTLS: PRELAUNCH: TAL: LIFTOFF: AOA: 3/1R ONORBIT: ATO: DEORBIT: LANDING/SAFING: A[2] B[F] C [P] REDUNDANCY SCREENS: LOCATION: PART NUMBER: KBS.LC3.AM2 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD JETTISON THE ANTENNA.

8/21/87 HIGHEST CRITICALITY HDW/FUNC DATE: SUBSYSTEM: MECH/KBD/EPD&C FLIGHT: 3/1R ABORT: MDAC ID: 4663 / ITEM: AMP #2 FAILURE MODE: FAILS OPEN LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) KU-BAND SUBSYSTEM 3) ELECTRICAL LCA3 4) 5) 6) 7) 8) 9) CRITICALITIES FLIGHT PHASE HDW/FUNC ABORT HDW/FUNC PRELAUNCH: RTLS: LIFTOFF: TAL: ONORBIT: 3/1R AOA: ATO: DEORBIT: LANDING/SAFING: REDUNDANCY SCREENS: A [2] B [F] C [P] LOCATION: PART NUMBER: KBS.LC3.AM2 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT JETTISON OF THE ANTENNA.

HIGHEST CRITICALITY HDW/FUNC 8/21/87 DATE: FLIGHT: 3/1R SUBSYSTEM: MECH/KBD/EPD&C ABORT: MDAC ID: ITEM: CONVERTER FAILURE MODE: FAILS SHORTED SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: A.D. MONTGOMERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) KU-BAND SUBSYSTEM 3) ELECTRICAL LCA1 4) PIC 5) 6) 7) 8) 9) CRITICALITIES FLIGHT PHASE HDW/FUNC HDW/FUNC ABORT PRELAUNCH: RTLS: TAL: LIFTOFF: 3/1R ONORBIT: AOA: ATO: DEORBIT: LANDING/SAFING: REDUNDANCY SCREENS: A [2] B [F] C [P] LOCATION: PART NUMBER: KBS.LC1.PIC.CON CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD JETTISON THE ANTENNA.

HIGHEST CRITICALITY HDW/FUNC DATE: 8/21/87 FLIGHT: 3/1R SUBSYSTEM: MECH/KBD/EPD&C / 4665 ABORT: MDAC ID: CONVERTER ITEM: FAILURE MODE: FAILS OPEN SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: A.D. MONTGOMERY BREAKDOWN HIERARCHY: MECHANICAL ACTUATION SYSTEM 1) 2) KU-BAND SUBSYSTEM ELECTRICAL 3) LCA1 4) 5) PIC 6) 7) 8) 9) CRITICALITIES ABORT HDW/FUNC HDW/FUNC FLIGHT PHASE RTLS: PRELAUNCH: TAL: LIFTOFF: 3/1R AOA: ONORBIT: ATO: DEORBIT: LANDING/SAFING: B [F] C [P] REDUNDANCY SCREENS: A [2] LOCATION: PART NUMBER: KBS.LC1.PIC.CON CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT JETTISON OF THE ANTENNA. REFERENCES:

HIGHEST CRITICALITY HDW/FUNC 8/21/87 DATE: 3/1R SUBSYSTEM: MECH/KBD/EPD&C FLIGHT: 4666 ABORT: MDAC ID: / ITEM: INVERTED AND GATE FAILURE MODE: FAILS SHORTED LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) KU-BAND SUBSYSTEM 3) ELECTRICAL 4) LCA1 PIC 5) 6) 7) 8) 9) CRITICALITIES FLIGHT PHASE HDW/FUNC ABORT HDW/FUNC PRELAUNCH: RTLS: / TAL: LIFTOFF: 3/1R AOA: ONORBIT: ATO: DEORBIT: LANDING/SAFING: REDUNDANCY SCREENS: A [2] B[F] C[P] LOCATION: PART NUMBER: KBS.LC1.PIC.IAG CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD JETTISON THE ANTENNA.

HDW/FUNC 8/21/87 HIGHEST CRITICALITY DATE: 3/1R FLIGHT: SUBSYSTEM: MECH/KBD/EPD&C ABORT: MDAC ID: 4667 INVERTED AND GATE ITEM: FAILURE MODE: FAILS OPEN LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) KU-BAND SUBSYSTEM ELECTRICAL 3) 4) LCA1 5) PIC 6) 7) 8) 9) CRITICALITIES HDW/FUNC HDW/FUNC ABORT FLIGHT PHASE RTLS: PRELAUNCH: TAL: LIFTOFF: 3/1R AOA: ONORBIT: ATO: DEORBIT: / LANDING/SAFING: B[F] C[P] REDUNDANCY SCREENS: A [2] LOCATION: PART NUMBER: KBS.LC1.PIC.IAG CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT JETTISON OF THE ANTENNA. REFERENCES:

DATE: 8/21/87 HIGHEST CRITICALITY HDW/FUNC SUBSYSTEM: MECH/KBD/EPD&C FLIGHT: 3/1R ABORT: / MDAC ID: 4668 CAPACITOR BANK ITEM: FAILURE MODE: FAILS SHORTED LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) KU-BAND SUBSYSTEM ELECTRICAL 3) 4) LCA1 5) PIC 6) 7) 8) 9) CRITICALITIES HDW/FUNC HDW/FUNC ABORT FLIGHT PHASE RTLS: PRELAUNCH: LIFTOFF: TAL: 3/1R ONORBIT: AOA: DEORBIT: ATO: LANDING/SAFING: A [2] B [F] C[P] REDUNDANCY SCREENS: LOCATION: PART NUMBER: KBS.LC1.PIC.CB CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD JETTISON THE ANTENNA.

HIGHEST CRITICALITY HDW/FUNC DATE: 8/21/87 SUBSYSTEM: MECH/KBD/EPD&C FLIGHT: 3/1R ABORT: MDAC ID: ITEM: CAPACITOR BANK FAILURE MODE: FAILS OPEN LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM KU-BAND SUBSYSTEM 3) ELECTRICAL 4) LCA1 5) PIC 6) 7) 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE RTLS: PRELAUNCH: / / LIFTOFF: TAL: ONORBIT: 3/1R AOA: ATO: DEORBIT: LANDING/SAFING: REDUNDANCY SCREENS: A [2] B [F] C [P] LOCATION: PART NUMBER: KBS.LC1.PIC.CB CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT JETTISON OF THE ANTENNA.

HIGHEST CRITICALITY HDW/FUNC DATE: 8/21/87 SUBSYSTEM: MECH/KBD/EPD&C FLIGHT: 3/1R ABORT: / MDAC ID: 4670 AND GATE ITEM: FAILURE MODE: FAILS SHORTED SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: A.D. MONTGOMERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM KU-BAND SUBSYSTEM 2) ELECTRICAL 3) 4) LCA1 5) PIC 6) 7) 8) 9) CRITICALITIES HDW/FUNC ABORT FLIGHT PHASE HDW/FUNC RTLS: PRELAUNCH: LIFTOFF: TAL: 3/1R **ONORBIT:** AOA: ATO: DEORBIT: LANDING/SAFING: C [P] REDUNDANCY SCREENS: A [2] B [F] LOCATION: PART NUMBER: KBS.LC1.PIC.AG CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD JETTISON THE ANTENNA.

HIGHEST CRITICALITY HDW/FUNC DATE: 8/21/87 3/1R FLIGHT: SUBSYSTEM: MECH/KBD/EPD&C ABORT: MDAC ID: 4671 / AND GATE ITEM: FAILURE MODE: FAILS OPEN SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: A.D. MONTGOMERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM KU-BAND SUBSYSTEM 2) ELECTRICAL 3) LCA1 4) PIC 5) 6) 7) 8) 9) CRITICALITIÉS FLIGHT PHASE HDW/FUNC ABORT HDW/FUNC RTLS: PRELAUNCH: TAL: LIFTOFF: 3/1R AOA: ONORBIT: ATO: DEORBIT: LANDING/SAFING: REDUNDANCY SCREENS: A [2] B [F] C [P] LOCATION: PART NUMBER: KBS.LC1.PIC.AG CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT JETTISON OF THE ANTENNA. REFERENCES:

DATE: 8/21/87 SUBSYSTEM: MECH/KBD/EPD&C MDAC ID: 4672	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: /
ITEM: AMP FAILURE MODE: FAILS SHORTED	
LEAD ANALYST: A.D. MONTGOMERY	SUBSYS LEAD: H.J. LOWERY
BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) KU-BAND SUBSYSTEM 3) ELECTRICAL 4) LCA1 5) PIC 6) 7) 8)	
CRITICA	LITIES
FLIGHT PHASE HDW/FUNC PRELAUNCH: / LIFTOFF: / ONORBIT: 3/3 DEORBIT: / LANDING/SAFING: /	ABORT HDW/FUNC RTLS: / TAL: / AOA: / ATO: /
REDUNDANCY SCREENS: A []	B [] C []
LOCATION: PART NUMBER: KBS.LC1.PIC.AMP	
CAUSES: PIECE-PART STRUCTURAL FAIR	LURE
EFFECTS/RATIONALE: NO EFFECT.	
REFERENCES:	

DATE: 8/21/87 SUBSYSTEM: MECH/KBD/EPD&C MDAC ID: 4673	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: /
ITEM: AMP FAILURE MODE: FAILS OPEN	
LEAD ANALYST: A.D. MONTGOMERY	SUBSYS LEAD: H.J. LOWERY
BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) KU-BAND SUBSYSTEM 3) ELECTRICAL 4) LCA1 5) PIC 6) 7) 8) 9)	
CRITICAL	ITIES
FLIGHT PHASE HDW/FUNC PRELAUNCH: / LIFTOFF: / ONORBIT: 3/3 DEORBIT: / LANDING/SAFING: /	ABORT HDW/FUNC RTLS: / TAL: / AOA: / ATO: /
,	в[] с[]
LOCATION: PART NUMBER: KBS.LC1.PIC.AMP	
CAUSES: PIECE-PART STRUCTURAL FAIL	URE
EFFECTS/RATIONALE: NO EFFECT.	
REFERENCES:	

HIGHEST CRITICALITY HDW/FUNC 8/21/87 DATE: 3/1R SUBSYSTEM: MECH/KBD/EPD&C FLIGHT: ABORT: / MDAC ID: 4674 TEST LOGIC ITEM: FAILURE MODE: FAILS SHORTED SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: A.D. MONTGOMERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM KU-BAND SUBSYSTEM 2) ELECTRICAL 3) 4) LCA1 5) PIC 6) 7) 8) 9) CRITICALITIES HDW/FUNC FLIGHT PHASE HDW/FUNC ABORT RTLS: PRELAUNCH: / LIFTOFF: TAL: 3/1R AOA: ONORBIT: ATO: DEORBIT: LANDING/SAFING: REDUNDANCY SCREENS: A [2] B [F] C [P] LOCATION: PART NUMBER: KBS.LC1.PIC.TL CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD JETTISON THE ANTENNA.

HIGHEST CRITICALITY HDW/FUNC 8/21/87 DATE: FLIGHT: 3/1R MECH/KBD/EPD&C SUBSYSTEM: ABORT: MDAC ID: 4675 ITEM: TEST LOGIC FAILURE MODE: FAILS OPEN LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM KU-BAND SUBSYSTEM 2) 3) ELECTRICAL LCA1 4) 5) PIC 6) 7) 8) 9) CRITICALITIES HDW/FUNC HDW/FUNC FLIGHT PHASE ABORT PRELAUNCH: / RTLS: TAL: LIFTOFF: 3/1R AOA: ONORBIT: ATO: DEORBIT: LANDING/SAFING: B [F] C[P] REDUNDANCY SCREENS: A [2] LOCATION: PART NUMBER: KBS.LC1.PIC.TL CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT JETTISON OF THE ANTENNA.

HIGHEST CRITICALITY HDW/FUNC 8/21/87 DATE: 3/1R SUBSYSTEM: MECH/KBD/EPD&C FLIGHT: ABORT: / MDAC ID: 4676 CONVERTER ITEM: FAILURE MODE: FAILS SHORTED SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: A.D. MONTGOMERY BREAKDOWN HIERARCHY: MECHANICAL ACTUATION SYSTEM 1) KU-BAND SUBSYSTEM 2) ELECTRICAL 3) 4) LCA3 PIC 5) 6) 7) 8) 9) CRITICALITIES ABORT HDW/FUNC HDW/FUNC FLIGHT PHASE / RTLS: PRELAUNCH: LIFTOFF: TAL: 3/1R ONORBIT: AOA: ATO: DEORBIT: LANDING/SAFING: C[P] B [F] REDUNDANCY SCREENS: A [2] LOCATION: PART NUMBER: KBS.LC3.PIC.CON CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD JETTISON THE ANTENNA.

HIGHEST CRITICALITY HDW/FUNC DATE: 8/21/87 FLIGHT: 3/1R MECH/KBD/EPD&C SUBSYSTEM: ABORT: MDAC ID: 4677 ITEM: CONVERTER FAILURE MODE: FAILS OPEN LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: MECHANICAL ACTUATION SYSTEM 2) KU-BAND SUBSYSTEM 3) ELECTRICAL 4) LCA3 5) PIC 6) 7) 8) 9) CRITICALITIES FLIGHT PHASE HDW/FUNC ABORT HDW/FUNC RTLS: PRELAUNCH: LIFTOFF: TAL: 3/1R AOA: ONORBIT: ATO: DEORBIT: LANDING/SAFING: REDUNDANCY SCREENS: A [2] B [F] C [P] LOCATION: PART NUMBER: KBS.LC3.PIC.CON CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT JETTISON OF THE ANTENNA.

HDW/FUNC HIGHEST CRITICALITY DATE: 8/21/87 FLIGHT: 3/1R SUBSYSTEM: MECH/KBD/EPD&C ABORT: MDAC ID: 4678 INVERTED AND GATE ITEM: FAILURE MODE: FAILS SHORTED SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: A.D. MONTGOMERY BREAKDOWN HIERARCHY: MECHANICAL ACTUATION SYSTEM KU-BAND SUBSYSTEM 2) ELECTRICAL 3) 4) LCA3 5) PIC 6) 7) 8) 9) CRITICALITIES FLIGHT PHASE HDW/FUNC HDW/FUNC ABORT RTLS: PRELAUNCH: TAL: LIFTOFF: 3/1R AOA: ONORBIT: ATO: DEORBIT: LANDING/SAFING: REDUNDANCY SCREENS: A [2] B [F] LOCATION: PART NUMBER: KBS.LC3.PIC.IAG CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD JETTISON THE ANTENNA.

HIGHEST CRITICALITY HDW/FUNC DATE: 8/21/87 SUBSYSTEM: MECH/KBD/EPD&C FLIGHT: 3/1R 4679 ABORT: MDAC ID: ITEM: INVERTED AND GATE FAILURE MODE: FAILS OPEN LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: MECHANICAL ACTUATION SYSTEM 1) 2) KU-BAND SUBSYSTEM 3) ELECTRICAL 4) LCA3 PIC 5) 6) 7) 8) 9) CRITICALITIES FLIGHT PHASE HDW/FUNC ABORT HDW/FUNC PRELAUNCH: RTLS: LIFTOFF: TAL: ONORBIT: 3/1R AOA: DEORBIT: ATO: LANDING/SAFING: REDUNDANCY SCREENS: B [F] A [2] CIPI LOCATION: PART NUMBER: KBS.LC3.PIC.IAG CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT JETTISON OF THE ANTENNA.

HIGHEST CRITICALITY HDW/FUNC 8/21/87 DATE: FLIGHT: 3/1R SUBSYSTEM: MECH/KBD/EPD&C ABORT: MDAC ID: 4680 ITEM: CAPACITOR BANK FAILURE MODE: FAILS SHORTED LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: MECHANICAL ACTUATION SYSTEM 1) KU-BAND SUBSYSTEM 2) 3) ELECTRICAL LCA3 4) PIC 5) 6) 7) 8) 9) CRITICALITIES ABORT HDW/FUNC FLIGHT PHASE HDW/FUNC PRELAUNCH: / RTLS: LIFTOFF: TAL: 3/1R AOA: ONORBIT: ATO: DEORBIT: LANDING/SAFING: B[F] C[P] REDUNDANCY SCREENS: A [2] LOCATION: PART NUMBER: KBS.LC3.PIC.CB CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD JETTISON THE ANTENNA.

HIGHEST CRITICALITY HDW/FUNC DATE: 8/21/87 FLIGHT: 3/1R SUBSYSTEM: MECH/KBD/EPD&C ABORT: MDAC ID: 4681 / ITEM: CAPACITOR BANK FAILURE MODE: FAILS OPEN LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: MECHANICAL ACTUATION SYSTEM 1) 2) KU-BAND SUBSYSTEM 3) ELECTRICAL LCA3 4) PIC 5) 6) 7) 8) 9) CRITICALITIES FLIGHT PHASE HDW/FUNC ABORT HDW/FUNC PRELAUNCH: / RTLS: LIFTOFF: TAL: 3/1R ONORBIT: AOA: ATO: DEORBIT: LANDING/SAFING: REDUNDANCY SCREENS: A [2] B [F] C [P] LOCATION: PART NUMBER: KBS.LC3.PIC.CB CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT JETTISON OF THE ANTENNA.

HIGHEST CRITICALITY HDW/FUNC 8/21/87 DATE: 3/1R SUBSYSTEM: MECH/KBD/EPD&C FLIGHT: ABORT: MDAC ID: 4682 ITEM: AND GATE FAILURE MODE: FAILS SHORTED LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) KU-BAND SUBSYSTEM 3) ELECTRICAL 4) LCA3 5) PIC 6) 7) 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE RTLS: / PRELAUNCH: / TAL: LIFTOFF: 3/1R AOA: ONORBIT: ATO: DEORBIT: LANDING/SAFING: REDUNDANCY SCREENS: A [2] B [F] C [P] LOCATION: PART NUMBER: KBS.LC3.PIC.AG CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD JETTISON THE ANTENNA.

HIGHEST CRITICALITY HDW/FUNC DATE: 8/21/87 3/1R SUBSYSTEM: MECH/KBD/EPD&C FLIGHT: ABORT: MDAC ID: 4683 / ITEM: AND GATE FAILURE MODE: FAILS OPEN LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: MECHANICAL ACTUATION SYSTEM 1) 2) KU-BAND SUBSYSTEM 3) ELECTRICAL 4) LCA3 PIC 5) 6) 7) 8) 9) CRITICALITIES FLIGHT PHASE HDW/FUNC ABORT HDW/FUNC PRELAUNCH: RTLS: / LIFTOFF: TAL: 3/1R AOA: ONORBIT: DEORBIT: ATO: LANDING/SAFING: REDUNDANCY SCREENS: A [2] B [F] C [P] LOCATION: PART NUMBER: KBS.LC3.PIC.AG CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT JETTISON OF THE ANTENNA.

DATE: 8/21/87 SUBSYSTEM: MECH/KBD/EPD&C MDAC ID: 4684	HIGHEST CRITICALITY HDW/FUNG FLIGHT: 3/3 ABORT: /
ITEM: AMP FAILURE MODE: FAILS SHORTED	
LEAD ANALYST: A.D. MONTGOMERY	SUBSYS LEAD: H.J. LOWERY
BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) KU-BAND SUBSYSTEM 3) ELECTRICAL 4) LCA3 5) PIC 6) 7) 8)	
CRITICAI	LITIES
FLIGHT PHASE HDW/FUNC PRELAUNCH: / LIFTOFF: / ONORBIT: 3/3 DEORBIT: / LANDING/SAFING: /	ABORT HDW/FUNC RTLS: / TAL: / AOA: / ATO: /
REDUNDANCY SCREENS: A []	B [] C []
LOCATION: PART NUMBER: KBS.LC3.PIC.AMP	
CAUSES: PIECE-PART STRUCTURAL FAIR	LURE
EFFECTS/RATIONALE: NO EFFECT.	

DATE: 8/21/87 SUBSYSTEM: MECH/KBD/EPD&C MDAC ID: 4685	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: /
ITEM: AMP FAILURE MODE: FAILS OPEN	인터 <u>화택된 경기 기능 - 보호 하는 보고</u> 기 ()
LEAD ANALYST: A.D. MONTGOMERY	SUBSYS LEAD: H.J. LOWERY
BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) KU-BAND SUBSYSTEM 3) ELECTRICAL 4) LCA3 5) PIC 6) 7) 8) 9)	
CRITICAL	ITIES
	ABORT HDW/FUNC RTLS: / TAL: / AOA: / ATO: /
REDUNDANCY SCREENS: A []	в[] с[]
LOCATION: PART NUMBER: KBS.LC3.PIC.AMP	
CAUSES: PIECE-PART STRUCTURAL FAIL	URE
EFFECTS/RATIONALE: NO EFFECT.	
REFERENCES:	

DATE: 8/21/87 SUBSYSTEM: MECH/KBD/EPD&C MDAC ID: 4686	F	TICALITY HD LIGHT: BORT:	W/FUNC 3/1R /
ITEM: TEST LOGIC FAILURE MODE: FAILS SHORTED			
LEAD ANALYST: A.D. MONTGOMERY	SUBSYS LEAD	H.J. LOWER	Y
BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) KU-BAND SUBSYSTEM 3) ELECTRICAL 4) LCA3 5) PIC 6) 7) 8) 9)			
CRITICAL	ITIES		
FLIGHT PHASE HDW/FUNC PRELAUNCH: / LIFTOFF: / ONORBIT: 3/1R DEORBIT: / LANDING/SAFING: /	ABORT RTLS: TAL: AOA: ATO:	HDW/FUNC / / /	
REDUNDANCY SCREENS: A [2]	B [F]	C [P]	
LOCATION: PART NUMBER: KBS.LC3.PIC.TL			
CAUSES: PIECE-PART STRUCTURAL FAIL	URE		
EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FA	ILURES COULD	JETTISON TH	E
REFERENCES:			

8/21/87 HIGHEST CRITICALITY HDW/FUNC DATE: SUBSYSTEM: MECH/KBD/EPD&C FLIGHT: 3/1R ABORT: MDAC ID: 4687 ITEM: TEST LOGIC FAILURE MODE: FAILS OPEN LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) KU-BAND SUBSYSTEM 3) ELECTRICAL 4) LCA3 5) PIC 6) 7) 8) 9) CRITICALITIES HDW/FUNC FLIGHT PHASE ABORT HDW/FUNC PRELAUNCH: RTLS: TAL: LIFTOFF: 3/1R ONORBIT: AOA: ATO: DEORBIT: LANDING/SAFING: REDUNDANCY SCREENS: A [2] B [F] C [P] LOCATION: PART NUMBER: KBS.LC3.PIC.TL CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO IMMEDIATE EFFECT. SUBSEQUENT FAILURES COULD PREVENT JETTISON OF THE ANTENNA.

C.5

PAYOAD BAY DOORS ANALYSIS WORKSHEETS

PAYLOAD BAY DOORS ANALYSIS WORKSHEETS SUMMARY

CRITICALITY REDUNDANCY	
FLIGHT ABORT SCREENS	
	NAME
5101 * 2/1R 2/1R P P P CENTERLINE/BULKHEAI	LATCH MTR
5102 * 2/1R 2/1R P F P CENTERLINE/BULKHEAN	
5103 3/3 3/3 CENTERLINE/BULKHEAN	
5104 * 2/1R 2/1R P F P CENTERLINE/BULKHEAI	
5105 3/3 3/3 CENTERLINE/BULKHEAN	
5106 * 2/1R 2/1R P F P CENTERLINE/BULKHEAI	
5107 * 1/1 1/1 CENTERLINE/BULKHEAN	LATCH GANG
5108 * 2/1R 2/1R P F P CENTERLINE/BULKHEAI	LATCH GANG
5109 * 1/1 1/1 CENTERLINE/BULKHEAI	
5110 * 1/1 1/1 CL/BLKHD TORQUE LIN	IITER
5111 * 1/1 1/1 CL/BLKHD TORQUE LIN	IITER
5112 * 1/1 1/1 CL/BLKHD TORQUE LIN	
5113 * 1/1 1/1 CENTERLINE/BULKHEAI	
5114 * 1/1 1/1 CENTERLINE/BULKHEAI	
5115 * 1/1 1/1 CENTERLINE/BULKHEAD	
5116 3/3 3/3 CL/BLKHD SWITCH OPE	
5117 3/2R 3/2R P P P CL/BLKHD SWITCH OPE	
5118 3/3 /NA CL/BLKHD CLOSED LIN	IIT SWITCH
5119 * 2/1R /NA P P P CL/BLKHD CLOSED LIN	
5120 * 1/1 1/1 CLLG TORQUE SHAFT/C	OUPLINGS
5121 * 1/1 1/1 CLLG TORQUE SHAFT/C	
5122 * 1/1 1/1 CENTERLINE LATCH AS	
5123 * 2/1R PNP CENTERLINE LATCH AS	SEMBLY
5124 3/3 /NA CENTERLINE LATCH AS	SEMBLY
5125 * 2/1R 2/1R PNP CL LATCH ROLLER ASS	EMBLY
5126 3/3 3/3 CL LATCH ROLLER ASS	EMBLY
5127 * 2/1R /NA P N F PBD SHFAR FITTING F	OLLER
5128 * 2/1R 2/1R P N P PBD SHEAR FITTING F	OLLER
5129 * 2/1R 2/1R P N P PBD SHEAR FITTING R	OLLER
5130 * 2/1R 2/1R P N F PBD SHEAR FITTING C	LAW
5131 * 2/1R 2/1R PNP PBD SHEAR FITTING O	LAW
5132 * 2/1R 2/1R P N P PBD SHEAR FITTING C	LAW
5133 * 2/1R 2/1R P N P BULKHEAD LATCH GANG	BELLCRANK
5134 * 2/1R 2/1R P N P BULKHEAD LATCH GANG	BELLCRANK
5135 * 2/1R 2/1R P N P BULKHEAD PUSH-PULL	ROD
5136 * 2/1R 2/1R P N P BULKHEAD PUSH-PULL	ROD
5137 * 2/1R 2/1R P N P BULKHEAD LATCH LINK	AGE
5136 * 2/1R 2/1R P N P BULKHEAD PUSH-PULL 5137 * 2/1R 2/1R P N P BULKHEAD LATCH LINK 5138 * 2/1R 2/1R P N P BULKHEAD LATCH LINK	AGE
5139 * 2/1R /NA PNP BULKHEAD LATCH LINK	AGE
5140 * 2/1R 2/1R P N P BULKHEAD ROLLER ASS	EMBLY
5141 3/3 3/3 BULKHEAD ROLLER ASS	EMBLY
5142 3/3 /NA BULKHEAD DOOR CLOSE	D SWITCH
5143 * 2/1R /NA P P P BULKHEAD DOOR CLOSE	
5144 3/3 /NA BULKHEAD READY-TO-L	ATCH SWITCH
5145 * 2/1R /NA P P P BULKHEAD READY-TO-L	ATCH SWITCH

^(*) Potential Critical Items.

PAYLOAD BAY DOORS ANALYSIS WORKSHEETS SUMMARY

	CRITIC	ALITY	REDUNDANCY	
	FLIGHT	ABORT		
MDAC-ID	H/F	H/F	A B C	ITEM NAME
5146 *	2/1R	2/1R	PPP	PAYLOAD BAY DOOR DRIVE MOTOR
5147 *	2/1R	2/1R		PAYLOAD BAY DOOR DRIVE CLUTCH
5148	3/3	3/3		PAYLOAD BAY DOOR DRIVE CLUTCH
5149 *	2/1R	2/1R	PFP	PAYLOAD BAY DOOR DRIVE BRAKE
5150	3/3	3/3		PAYLOAD BAY DOOR DRIVE BRAKE
5151 *	2/1R	2/1R	PFP	PBD CLUTCH/BRAKE DISC
5152 *	1/1	1/1		PBD DRIVE DIFFERENTIAL
5153 *	2/2	$\frac{1}{2}/\frac{1}{2}$		PBD DRIVE DIFFERENTIAL
5154 *	1/1	1/1		PBD DRIVE DIFFERENTIAL
5155 *	1/1	1/1		PAYLOAD BAY DOOR DRIVE GEARBOX
5156 *	1/1	1/1		PAYLOAD BAY DOOR DRIVE GEARBOX
5157 *	2/2	2/2	•	PAYLOAD BAY DOOR DRIVE GEARBOX
5158 *	1/1	1/1		PAYLOAD BAY DOOR DRIVE TORQUE
	2/1R	2/1R	PNF	PBD DRIVE SUPPORT ASSEMBLY
5160 *	1/1	1/1		PBD DRIVE SUPPORT ASSEMBLY
5161 *	1/1	1/1		PBD DRIVE SUPPORT ASSEMBLY
5162	3/1R	3/1R	P N P	PBD DRIVE ROTARY ACT/TL
5163 *	1/1	1/1		PBD DRIVE ROTARY ACT/TL
5164 *	1/1	1/1		PBD DRIVE ROTARY ACT/TL
5165 *	1/1	1/1		PBD DRIVE ROTARY ACT/TL
5166 *	1/1	1/1		PBD DRIVE ROTARY ACT/TL
5167 *	2/1R	2/1R	P N P	PBD DRIVE ROTARY ACT/TL
5168 *	1/1	1/1		PAYLOAL BAY DOOR DRIVE LINKAGE
5169	3/1R	3/1R	PNP	PAYLOAD BAY DOOR DRIVE LINKAGE
5170	3/3	3/3		PBD OPEN LIMIT SWITCH
5171	3/2R	3/2R	PPP	PBD OPEN LIMIT SWITCH
5172	3/3	/NA		PBD 88 DEG LIMIT SWITCH
5173	3/3	/NA	•	PBD 88 DEG LIMIT SWITCH
5174 *	1/1	1/1		PAYLOAD BAY DOOR
5175 *	1/1	1/1		PAYLOAD BAY DOOR
5176 *	2/1R	2/1R		PBD ALIGNMENT ROLLER
5177	3/1R	3/1R	PNP	PBD ALIGNMENT ROLLER GUIDE
5178	3/3	3/3		PAYLOAD BAY DOOR PASSIVE STOP
5179	3/1R	3/1R	РИР	PBD SHEAR/FLOATING HINGE
5501 *	2/1R	2/1R		CONTROL BUS 1.2K RESISTOR
5502 *	2/1R	2/1R		CONTROL BUS 1.2K RESISTOR
5503 *	2/1R	2/1R		CONTROL BUS 1.2K RESISTOR
5504 *	2/1R	2/1R		PBD CONTROL SWITCH
5505 *	2/1R	2/1R		FUSE, 1A
5506 *	2/1R	2/1R		PBD MECHANICAL POWER SWITCH
5507 *	2/1R			MAIN DC BUS RELAY
5508 5500	3/3	3/3		MAIN DC BUS RELAY
5509 5510	3/3	3/3		DIODE
5510	3/3	3/3		DIODE
5511 *	2/1R	2/1R	PFP	SWITCH RESISTOR, 1.2K 2W

^(*) Potential Critical Items.

PAYLOAD BAY DOORS ANALYSIS WORKSHEETS SUMMARY

	CRITIC	ALITY	REDU	JNI	DANCY	
	FLIGHT	ABORT	SCI	REE	ens	
MDAC-ID	H/F	H/F	A	В	C	ITEM NAME
						CULTURE DESCRIPTION 1 AV AV
5512	3/3	3/3				SWITCH RESISTOR, 1.2K 2W
5513 *	2/1R	2/1R	P	F	P	SWITCH RESISTOR, 1.2K 2W
5514 *	2/1R	2/1R	P	F	P	PAYLOAD BAY DOORS AC BUS RELAY
5515 *	2/1R	2/1R	P	F	P	PAYLOAD BAY DOORS AC BUS RELAY
5516 *	2/1R	2/1R	P	N	P	MCA AC POWER CIRCUIT BREAKER
5517 *	2/1R	2/1R	P	P	P	MCA RELAY LOGIC POWER SWITCH
5518	3/3	3/3				MCA RELAY LOGIC POWER SWITCH
5519 *	2/1R	2/1R	P	F	P	REMOTE POWER CONTROLLER

^(*) Potential Critical Items.

DATE: 7/22/87 HIGHEST CRITICALITY HDW/FUNC SUBSYSTEM: MECH/PBD FLIGHT: 2/1R MDAC ID: 5101 ABORT: 2/1R

ITEM: CENTERLINE/BULKHEAD LATCH MOTOR

FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PAYLOAD BAY DOORS SUBSYSTEM
- 3) CENTERLINE/BULKHEAD LATCH MOTOR

4)

5)

6)

7) 8)

9)

CRITICALITIES

	71.2 =		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	
LIFTOFF:	·	TAL:	
ONORBIT:	2/1R	AOA:	/
DEORBIT:	2/1R	ATO:	2/1R
LANDING/SAFI	NG: /		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: STARBOARD PBD, STARBOARD/PORT AND FORE/AFT PAYLOAD

BAY BULKHEADS

PART NUMBER: MC287-0040, MC287-0039

CAUSES: MECHANICAL SHOCK, PIECE-PART FAILURE, TEMPERATURE, LOSS OF INPUT

EFFECTS/RATIONALE:

THE LOSS OF A MOTOR WOULD RESULT IN LATCHING/UNLATCHNING TAKING A LONGER TIME. THE LOSS OF THE REDUNDANT MOTOR ON A CENTERLINE LATCH GANG IS MORE SERIOUS THAN FOR THE BULKHEAD LATCH GANG. THE FAILURE TO LATCH A BULKHEAD GANG (4 LATCHES) STILL ALLOWS FOR A SAFE ENTRY. ONLY 2 CENTERLINE LATCHES, EXCEPT FOR THE 15-16 PAIR, CAN BE UNLATCHED FOR A SAFE ENTRY. FAILURE TO UNLATCH A GANG WOULD PREVENT PBD OPENING AND CAUSES A LOSS OF MISSION.

REFERENCES: V070-594300, V070-594360, V070-594160, V070-594250, V070-594260, MC287-0040, MC287-0039

7/22/87 HIGHEST CRITICALITY HDW/FUNC DATE: 2/1R FLIGHT: SUBSYSTEM: MECH/PBD 2/1R ABORT: MDAC ID: 5102 ITEM: CENTERLINE/BULKHEAD LATCH MOTOR CLUTCH FAILURE MODE: FAILS TO ENGAGE LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: MECHANICAL ACTUATION SYSTEM PAYLOAD BAY DOORS SUBSYSTEM 3) CENTERLINE/BULKHEAD LATCH MOTOR CLUTCH 4) 5) 6) 7) 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE / / RTLS: PRELAUNCH: TAL: LIFTOFF: 2/1R AOA: ONORBIT: ATO: 2/1R 2/1R DEORBIT: LANDING/SAFING: B [F] C [P] REDUNDANCY SCREENS: A [2] STARBOARD PBD, STARBOARD/PORT AND FORE/AFT PAYLOAD LOCATION: BAY BULKHEADS

PART NUMBER: MC287-0040, MC287-0039

CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE, CAUSES: TEMPERATURE, LOSS OF INPUT, VIBRATION

EFFECTS/RATIONALE:

FAILURE OF CLUTCH TO ENGAGE WHEN POWER APPLIED WOULD PREVENT THE MOTOR SHAFT FROM ROTATING. REDUNDANT MOTOR WOULD COMPLETE LATCH/UNLATCHING BUT AT A SLOWER RATE. NO EFFECT ON CREW/VEHICLE OR MISSION.

REFERENCES: V070-594300, V070-594360, V070-594160, V070-594250, V070-594260, MC287-0040, MC287-0039

HDW/FUNC HIGHEST CRITICALITY 7/22/87 DATE: 3/3 FLIGHT: SUBSYSTEM: MECH/PBD 3/3 ABORT: 5103 MDAC ID: CENTERLINE/BULKHEAD LATCH MOTOR CLUTCH ITEM: FAILS TO DISENGAGE FAILURE MODE: SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: J. BACHER BREAKDOWN HIERARCHY: MECHANICAL ACTUATION SYSTEM 1) PAYLOAD BAY DOORS SUBSYSTEM 2) CENTERLINE/BULKHEAD LATCH MOTOR CLUTCH 3) 4) 5) 6) 7) 8) 9) CRITICALITIES HDW/FUNC HDW/FUNC ABORT FLIGHT PHASE / RTLS: PRELAUNCH: TAL: / LIFTOFF: 3/3 ONORBIT: AOA: 3/3 ATO: DEORBIT: LANDING/SAFING: / C [B [] REDUNDANCY SCREENS: A [] STARBOARD PBD, STARBOARD/PORT AND FORE/AFT PAYLOAD LOCATION: BAY BULKHEADS PART NUMBER: MC287-0040, MC287-0039 CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE, CAUSES: TEMPERATURE, VIBRATION EFFECTS/RATIONALE: FAILURE OF THE CLUTCH TO DISENGAGE WOULD ALLOW THE MOTOR SHAFT TO ROTATE INSTEAD OF BEING STOPPED. SINCE THIS OCCURS AFTER LATCH/UNLATCHING THIS HAS MINIMAL IMPACT. THE FAILURE WOULD BE IMPORTANT IF THE ASSOCIATED MOTOR ALSO WERE TO FAIL. THIS WOULD CAUSE A LOSS OF OUTPUT FROM THE DIFFERENTIAL AND THE LOSS OF A LATCH GANG. REFERENCES: V070-594300, V070-594360, V070-594160, V070-594250,

V070-594260, MC287-0040, MC287-0039

DATE: 7/22/87 HIGHEST CRITICALITY HDW/FUNC SUBSYSTEM: MECH/PBD FLIGHT: 2/1R

MDAC ID: 5104 ABORT: 2/1R

ITEM: CENTERLINE/BULKHEAD LATCH MOTOR BRAKE

FAILURE MODE: FAILS TO DISENGAGE

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PAYLOAD BAY DOORS SUBSYSTEM
- 3) CENTERLINE/BULKHEAD LATCH MOTOR BRAKE

4)

5)

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	. /	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	2/1R	ATO:	2/1R
LANDING/SAF	ING: /		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: STARBOARD PBD, STARBOARD/PORT AND FORE/AFT PAYLOAD

BAY BULKHEADS

PART NUMBER: MC287-0040, MC287-0039

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE,

TEMPERATURE, LOSS OF INPUT, VIBRATION

EFFECTS/RATIONALE:

FAILURE OF BRAKE TO DISENGAGE WHEN POWER IS APPLIED WOULD PREVENT THE MOTOR SHAFT FROM ROTATING. REDUNDANT MOTOR WOULD COMPLETE LATCH/UNLATCHING BUT AT A SLOWER RATE. NO EFFECT ON CREW/VEHICLE OR MISSION.

REFERENCES: V070-594300, V070-594360, V070-594160, V070-594250, V070-594260, MC287-0040, MC287-0039

7/22/87

DATE:

HIGHEST CRITICALITY HDW/FUNC

3/3 FLIGHT: SUBSYSTEM: MECH/PBD 3/3 ABORT: 5105 MDAC ID: CENTERLINE/BULKHEAD LATCH MOTOR BRAKE ITEM: FAILURE MODE: FAILS TO ENGAGE LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM PAYLOAD BAY DOORS SUBSYSTEM CENTERLINE/BULKHEAD LATCH MOTOR BRAKE 3) 4) 5) 6) 7) 8) 9) CRITICALITIES HDW/FUNC HDW/FUNC ABORT FLIGHT PHASE 1 PRELAUNCH: RTLS: TAL: / LIFTOFF: 3/3 AOA: ONORBIT: ATO: DEORBIT: 3/3 LANDING/SAFING: B [] C [] REDUNDANCY SCREENS: A [] STARBOARD PBD, STARBOARD/PORT AND FORE/AFT PAYLOAD LOCATION: BAY BULKHEADS PART NUMBER: MC287-0040, MC287-0039 CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE, TEMPERATURE, LOSS OF INPUT, VIBRATION EFFECTS/RATIONALE: EFFECT OF BRAKE FAILING TO ENGAGE WOULD BE THAT THE MOTOR SHAFT WOULD STILL BE ABLE TO ROTATE INSTEAD OF BEING LOCKED, SINCE THIS OCCURS AFTER LATCHING/UNLATCHING THIS HAS MINIMAL IMPACT. THIS FAILURE WOULD BE IMPORTANT IF THE ASSOCIATED MOTOR ALSO WERE TO FAIL WHICH WOULD THEN RESULT IN THE REDUNDANT MOTOR BACKDRIVING THE FAILED ONE WHICH WOULD CAUSE A LOSS OF OUTPUT FROM THE DIFFERENTIAL AND LOSS OF A LATCH GANG.

HIGHEST CRITICALITY HDW/FUNC 7/22/87 DATE: SUBSYSTEM: MECH/PBD FLIGHT: 2/1R ABORT: 2/1R 5106 MDAC ID:

CENTERLINE/BULKHEAD LATCH MOTOR CLUTCH/BRAKE DISC ITEM:

FAILURE MODE: SLIPS

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- PAYLOAD BAY DOORS SUBSYSTEM
- CENTERLINE/BULKHEAD LATCH MOTOR 3)
- CLUTCH/BRAKE DISC 4)

5)

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	,	TAL:	/
ONORBIT:	· 2/1R	AOA:	/
DEORBIT:	2/1R	ATO:	2/1R
LANDING/SAFI	NG: /		

REDUNDANCY SCREENS: A [2] B [F] C [P]

STARBOARD PBD, STARBOARD/PORT AND FORE/AFT PAYLOAD LOCATION:

BAY BULKHEADS

PART NUMBER: MC287-0040, MC287-0039

CAUSES: CONTAMINATION, TEMPERATURE

EFFECTS/RATIONALE:

SLIPPING OF THE CLUTCH/BRAKE DISC WOULD REDUCE THE INPUT TO THE DIFFERENTIAL AND THE RATE OF LATCH GANG OPEN/CLOSING. REDUNDANT MOTOR WOULD SUPPLY LATCH OPERATION POWER. LOSS OF MOTOR ALONG WITH CLUTCH/BRAKE FAILURE WOULD PERMIT BACKDRIVING BY REMAINING MOTOR, NO OUTPUT FROM THE DIFFERENTIAL AND POSSIBLE LOSS OF MISSION OR CREW/VEHICLE.

REFERENCES: V070-594300, V070-594360, V070-594160, V070-594250, V070-594260, MC287-0040, MC287-0039

HIGHEST CRITICALITY HDW/FUNC 7/22/87 DATE: 1/1 FLIGHT: SUBSYSTEM: MECH/PBD 1/1 ABORT: MDAC ID: 5107 CENTERLINE/BULKHEAD LATCH GANG DIFFERENTIAL ITEM: FAILURE MODE: LOSS OF OUTPUT SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: J. BACHER BREAKDOWN HIERARCHY: MECHANICAL ACTUATION SYSTEM 2) PAYLOAD BAY DOORS SUBSYSTEM CENTERLINE/BULKHEAD LATCH GANG DIFFERENTIAL 3) 4) 5) 6) 7) 8) 9) CRITICALITIES HDW/FUNC FLIGHT PHASE HDW/FUNC ABORT PRELAUNCH: RTLS: TAL: LIFTOFF: 1/1 AOA: ONORBIT: ATO: DEORBIT: 1/1 LANDING/SAFING: B[] C[] REDUNDANCY SCREENS: A [] STARBOARD PBD, STARBOARD/PORT AND FORE/AFT PAYLOAD LOCATION: BAY BULKHEADS PART NUMBER: MC287-0040, MC287-0039 CAUSES: MECHANICAL SHOCK, PIECE-PART FAILURE, TEMPERATURE, LOSS OF INPUT, VIBRATION EFFECTS/RATIONALE: THE EFFECT OF THIS FAILURE WOULD BE THE INABILITY TO LATCH/UNLATCH A CENTER/BULKHEAD LATCH GANG. IF UNABLE TO UNLATCH A GANG WHEN OPENING THE PBD THEN A LOSS OF MISSION RESULTS. UNABLE TO LATCH A CENTERLINE LATCH GANG THEN AN UNSAFE CONDITION WOULD EXIST ON ENTRY. AN EVA CAPABILITY EXISTS TO SECURE TWO FAILED LATCHES. BULKHEAD LATCH GANG CAN FAIL OPEN AND LEAVE SUFFICIENT

REFERENCES: V070-594300, V070-594360, V070-594160, V070-594250, V070-594260, MC287-0040, MC287-0039

STRUCTURAL INTEGRITY FOR A SAFE ENTRY.

DATE: 7/22/87 HIGHEST CRITICALITY HDW/FUNC SUBSYSTEM: MECH/PBD FLIGHT: 2/1R

MDAC ID: 5108 ABORT: 2/1R

ITEM: CENTERLINE/BULKHEAD LATCH GANG DIFFERENTIAL

FAILURE MODE: PARTIAL OUTPUT

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

1) MECHANICAL ACTUATION SYSTEM
2) PAYLOAD BAY DOORS SUBSYSTEM

3) CENTERLINE/BULKHEAD LATCH GANG DIFFERENTIAL

4)

5)

6) 7)

8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	,	RTLS:	/
LIFTOFF:	,	TAL:	/
ONORBIT:	2/1R	AOA:	/ 100
DEORBIT:	2/1R	ATO:	2/1R
LANDING/SAFI	NG: /		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: STARBOARD PBD, STARBOARD/PORT AND FORE/AFT PAYLOAD

BAY BULKHEADS

PART NUMBER: MC287-0040, MC287-0039

CAUSES: CONTAMINATION, PIECE-PART FAILURE, TEMPERATURE, PARTIAL

INPUT

EFFECTS/RATIONALE:

IF OUTPUT OF TORQUE FROM THE DIFFERENTIAL WAS LOW ENOUGH THE SINGLE MOTOR DRIVE TIME LIMIT WOULD BE HIT. THE COMBINATION OF EXCESSIVE TIME AND NO VISUAL CUE OF WHETHER THE CENTERLINE LATCH HOOKS ARE CLEAR OF THE ROLLERS WOULD END PBD OPENING CAUSING A LOSS OF MISSION. IF UNABLE TO CLOSE CENTERLINE LATCH GANG THE POSSIBILITY EXISTS OF LOSS OF CREW/VEHICLE. AN EVA COULD BE PERFORMED TO SECURE 2 OF THE 4 LATCHES IN A GANG WHICH WOULD ALLOW A SAFE ENTRY. A SAFE ENTRY CAN BE MADE WITH A BULKHEAD GANG FAILED OPEN. VISUAL CUES AS TO THE STATE OF THE BULKHEAD LATCHES ARE AVAILABLE.

REFERENCES: V070-594300, V070-594360, V070-594160, V070-594250, V070-594260, MC287-0040, MC287-0039, FLIGHT RULES SECTION 10-MMACS

REPORT DATE 11/25/87 C-522

HIGHEST CRITICALITY HDW/FUNC 7/22/87 DATE: 1/1 FLIGHT: SUBSYSTEM: MECH/PBD 1/1 ABORT: MDAC ID: 5109 CENTERLINE/BULKHEAD LATCH GANG DIFFERENTIAL ITEM: FAILURE MODE: PHYSICAL BINDING/JAMMING SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: J. BACHER BREAKDOWN HIERARCHY: MECHANICAL ACTUATION SYSTEM 2) PAYLOAD BAY DOORS SUBSYSTEM CENTERLINE/BULKHEAD LATCH GANG DIFFERENTIAL 3) 4) 5) 6) 7) 8) 9) CRITICALITIES HDW/FUNC HDW/FUNC ABORT FLIGHT PHASE RTLS: PRELAUNCH: TAL: LIFTOFF: 1/1 AOA: ONORBIT: 1/1 ATO: DEORBIT: 1/1 LANDING/SAFING: C[] B [] REDUNDANCY SCREENS: A [] STARBOARD PBD, STARBOARD/PORT AND FORE/AFT PAYLOAD LOCATION: BAY BULKHEADS PART NUMBER: MC287-0040, MC287-0039 CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE, CAUSES: TEMPERATURE, VIBRATION EFFECTS/RATIONALE: THE EFFECT OF THIS FAILURE WOULD BE THE INABILITY TO LATCH/UNLATCH A CENTER/BULKHEAD LATCH GANG. IF UNABLE TO UNLATCH A GANG WHEN OPENING THE PBD THEN A LOSS OF MISSION RESULTS. IF UNABLE TO LATCH A CENTERLINE LATCH GANG THEN AN UNSAFE CONDITION WOULD EXIST ON ENTRY. AN EVA CAPABILITY EXISTS TO SECURE TWO FAILED LATCHES. BULKHEAD LATCH GANG CAN FAIL OPEN AND LEAVE SUFFICIENT STRUCTURAL INTEGRITY FOR A SAFE ENTRY.

V070-594260, MC287-0040, MC287-0039

REFERENCES: V070-594300, V070-594360, V070-594160, V070-594250,

HIGHEST CRITICALITY HDW/FUNC DATE: 7/22/87 SUBSYSTEM: MECH/PBD FLIGHT: 1/1 1/1 ABORT: MDAC ID: 5110 CENTERLINE/BULKHEAD TORQUE LIMITER ITEM: FAILURE MODE: FAILS TO OPERATE SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: J. BACHER BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM PAYLOAD BAY DOORS SUBSYSTEM 3) CENTERLINE/BULKHEAD TORQUE LIMITER 4) 5) 6) 7) 8) 9) CRITICALITIES HDW/FUNC FLIGHT PHASE HDW/FUNC ABORT RTLS: PRELAUNCH: / / LIFTOFF: TAL: ONORBIT: 1/1 AOA: 1/1 ATO: · DEORBIT: 1/1 LANDING/SAFING: B[] C[] REDUNDANCY SCREENS: A [] STARBOARD PBD, STARBOARD/PORT AND FORE/AFT PAYLOAD LOCATION: BAY BULKHEADS PART NUMBER: MC287-0040, MC287-0039 CAUSES: CONTAMINATION, MECHANICAL SHOCK, OVERLOAD, PIECE-PART FAILURE, TEMPERATURE, LOSS OF INPUT, VIBRATION EFFECTS/RATIONALE: FAILURE OF TORQUE LIMITER TO SLIP DUE TO EXCESSIVE TORQUE COULD CAUSE COMPONENTS TO BREAK OR BE DAMAGED. POSSIBLE LOSS OF MISSION IF UNABLE TO OPEN BPD AND LOSS OF CREW/VEHICLE IF UNABLE TO CLOSE PBD BECAUSE OF JAMMED OR BROKEN COMPONENTS. EVA CAPABILITY EXISTS TO CLOSE PBDS. CENTERLINE LATCH GANG MUST BE LATCHED FOR A SAFE ENTRY, BULKHEAD GANG CAN FAIL OPEN FOR A SAFE ENTRY.

HIGHEST CRITICALITY HDW/FUNC 7/22/87 DATE: FLIGHT: 1/1 MECH/PBD SUBSYSTEM: ABORT: 1/1 5111 MDAC ID: CENTERLINE/BULKHEAD TORQUE LIMITER ITEM: FAILURE MODE: FAILS OUT OF TOLERANCE, SLIPS AT LESS THAN MINIMUM ALLOWABLE LIMIT LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM PAYLOAD BAY DOORS SUBSYSTEM 2) CENTERLINE/BULKHEAD TORQUE LIMITER 3) 4) 5) 6) 7) 8) 9) CRITICALITIES HDW/FUNC HDW/FUNC ABORT FLIGHT PHASE PRELAUNCH: RTLS: / TAL: LIFTOFF: 1/1 AOA: ONORBIT: 1/1 ATO: DEORBIT: 1/1 LANDING/SAFING: REDUNDANCY SCREENS: A [] B [] C [] STARBOARD PBD, STARBOARD/PORT AND FORE/AFT PAYLOAD LOCATION: BAY BULKHEADS PART NUMBER: MC287-0040, MC287-0039 CAUSES: CONTAMINATION, MECHANICAL SHOCK, MISHANDLING/ABUSE, PIECE-PART FAILURE, TEMPERATURE, VIBRATION EFFECTS/RATIONALE: TORQUE LIMITER SLIPPING AT LESS THAN THE MINIMUM SPECIFIED LIMIT COULD CAUSE A LATCH GANG TO NOT LATCH/UNLATCH. THE FAILURE TO LATCH A BULKHEAD LATCH GANG STILL ALLOWS MARGIN FOR A SAFE ENTRY. THE FAILURE OF A CENTERLINE LATCH GANG LOWERS THE STRUCTURAL INTEGRITY OF THE ORBITER LEADING TO A POSSIBLE LOSS OF CREW/VEHICLE. EVA CAN BE PERFORMED TO SECURE A FAILED LATCH. REFERENCES: V070-594300, V070-594360, V070-594160, V070-594250,

V070-594260, MC287-0040, MC287-0039

	SYSTEM:					HIG	HEST	FLI	CALI GHT: RT:		HDW/FUNC 1/1 1/1
	: LURE MOD WABLE L		TERLIN LS OUT	E/BU	JLKHEAI TOLERA	TORQI	UE LI DOES	MITER NOT S	LIP	AT 1	MUMIXAM
LEAD	ANALYS'	T: J. B	ACHER	, a	SUBS	YS LE	AD: H	.J. I	OWER	Y	
1) 2)	MECHAN PAYLOA CENTER	ICAL ACT	: TUATIO DORS S	N SY UBSY	STEM	MITER					· -
					CRITICA	LITIES	S				
	FLIGHT		HD		INC	A	BORT	.	HDW/		C
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	ONOR			1/1			AOA	:	/		
	DEOR	BIT: ING/SAF		1/1			ATC		1/		
REDU	INDANCY	SCREENS:	. A	[]	В []	c	[]	
BAY	TION: BULKHEA NUMBER	DS		-			PORT	AND F	ORE/	AFT	PAYLOAD
CAUS PIEC	SES: CO	NTAMINA? FAILURE,	TION, TEMP	MECH ERAI	IANICAI TURE, V	SHOC	K, MI ION	SHAND	LING	/ABI	USE,
POSS	CTS/RAT	MAGE TO									
occu	IRS. FA	ILURE OF	A CE	NTEF	RLINE I	ATCH !	rorqu	E SHA	FT C	OUL	D FAIL
	RY. POS	SIBLE LO	SS OF	CRE	EW/VEHI	CLE I	F ANY	DAMA	GE S	EVE	RE
REFE	RENCES:	V070-5	594300	, VC)70 - 594	360, 1	V070-	59416	o, v	′070·	-594250,
V070	-594260	, MC287-	-0040,	MC2	87-003	9			•		·

HIGHEST CRITICALITY HDW/FUNC 7/22/87 DATE: FLIGHT: 1/1 SUBSYSTEM: MECH/PBD 1/1 ABORT: MDAC ID: 5113 CENTERLINE/BULKHEAD GEARBOX ITEM: FAILURE MODE: FAILS TO TRANSFER MOTOR OUTPUT SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: J. BACHER BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM PAYLOAD BAY DOORS SUBSYSTEM CENTERLINE/BULKHEAD GEARBOX 3) 4) 5) 6) 7) 8) 9) CRITICALITIES HDW/FUNC HDW/FUNC ABORT FLIGHT PHASE PRELAUNCH: / RTLS: / TAL: LIFTOFF: AOA: 1/1 ONORBIT: ATO: DEORBIT: LANDING/SAFING: REDUNDANCY SCREENS: A [] B [] C [] STARBOARD PBD, STARBOARD/PORT AND FORE/AFT PAYLOAD LOCATION: BAY BULKHEADS PART NUMBER: MC287-0040, MC287-0039 CAUSES: MECHANICAL SHOCK, OVERLOAD, PIECE-PART FAILURE, TEMPERATURE, VIBRATION EFFECTS/RATIONALE: FAILURE OF GEARBOX WOULD CAUSE THE LOSS OF A LATCH GANG. LOSS OF MISSION WOULD OCCUR IF THIS HAPPENED WHEN OPENING PBD AND LATCHES WERE NOT CLEAR OF ROLLERS. POSSIBLE LOSS OF CREW/VEHICLE IF CENTERLINE LATCH GANG COULD NOT BE LATCHED AND CREW DOES NOT DETECT THIS. THERE IS AN EVA PROCEDURE TO SECURE FAILED LATCHES. REFERENCES: V070-594300, V070-594360, V070-594160, V070-594250, V070-594260, MC287-0040, MC287-0039

HIGHEST CRITICALITY HDW/FUNC 7/22/87 DATE: FLIGHT: 1/1 SUBSYSTEM: MECH/PBD ABORT: 1/1 MDAC ID: 5114 CENTERLINE/BULKHEAD GEARBOX ITEM: FAILURE MODE: PHYSICAL BINDING/JAMMING LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM PAYLOAD BAY DOORS SUBSYSTEM 2) CENTERLINE/BULKHEAD GEARBOX 3) 4) 5) 6) 7) 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE RTLS: PRELAUNCH: / / TAL: LIFTOFF: ONORBIT: 1/1 AOA: 1/1 DEORBIT: ATO: 1/1 LANDING/SAFING: C [] REDUNDANCY SCREENS: B [] A [] STARBOARD PBD, STARBOARD/PORT AND FORE/AFT PAYLOAD LOCATION: BAY BULKHEADS PART NUMBER: MC287-0040, MC287-0039 CAUSES: CONTAMINATION, MECHANICAL SHOCK, OVERLOAD, PIECE-PART FAILURE, TEMPERATURE EFFECTS/RATIONALE: FAILURE WOULD CAUSE THE LOSS OF A LATCH GANG. LOSS OF MISSION WOULD OCCUR IF THIS HAPPENED WHEN OPENING PBD AND LATCHES WERE NOT CLEAR OF ROLLERS. POSSIBLE LOSS OF CREW/VEHICLE IF CENTERLINE LATCH GANG COULD NOT BE LATCHED. EVA PROCEDURE EXISTS TO SECURE FAILED LATCHES.

V070-594260, MC287-0040, MC287-0039

REFERENCES: V070-594300, V070-594360, V070-594160, V070-594250.

HIGHEST CRITICALITY HDW/FUNC 7/22/87 1/1 FLIGHT: SUBSYSTEM: MECH/PBD 1/1 ABORT: MDAC ID: 5115 CENTERLINE/BULKHEAD GEARBOX ITEM: FAILURE MODE: PARTIAL OUTPUT LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM PAYLOAD BAY DOORS SUBSYSTEM 2) CENTERLINE/BULKHEAD GEARBOX 3) 4) 5) 6) 7) 8) 9) CRITICALITIES HDW/FUNC HDW/FUNC ABORT FLIGHT PHASE RTLS: PRELAUNCH: / TAL: LIFTOFF: / 1/1 AOA: ONORBIT: ATO: 1/1 DEORBIT: LANDING/SAFING: C [] REDUNDANCY SCREENS: A [] B [] STARBOARD PBD, STARBOARD/PORT AND FORE/AFT PAYLOAD LOCATION: BAY BULKHEADS PART NUMBER: MC287-0040, MC287-0039 CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE, TEMPERATURE, VIBRATION EFFECTS/RATIONALE: INSUFFICIENT OUTPUT WOULD NOT FULLY LATCH/UNLATCH A GANG. SINGLE MOTOR DRIVE TIME WOULD BE REACHED BEFORE FULL LATCH TRAVEL COMPLETED. VISUAL CUES ARE AVAILABLE FOR THE BULKHEAD LATCHES BUT NOT THE CENTERLINE ONES. FAILURE TO LATCH A CENTERLINE GANG COULD RESULT IN THE LOSS OF CREW/VEHICLE. FAILURE TO UNLATCH A GANG WOULD CAUSE THE LOSS OF MISSION. REFERENCES: V070-594300, V070-594360, V070-594160, V070-594250,

V070-594260, MC287-0040, MC287-0039

HIGHEST CRITICALITY HDW/FUNC DATE: 7/22/87 FLIGHT: 3/3 SUBSYSTEM: MECH/PBD ABORT: 3/3 MDAC ID: 5116 CENTERLINE/BULKHEAD OPEN LIMIT SWITCH ITEM: FAILURE MODE: FAILS TO SWITCH LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM PAYLOAD BAY DOORS SUBSYSTEM 3) CENTERLINE/BULKHEAD OPEN LIMIT SWICH 4) 5) 6) 7) 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE RTLS: PRELAUNCH: / / TAL: LIFTOFF: 3/3 ONORBIT: AOA: 3/3 DEORBIT: ATO: LANDING/SAFING: B[] C[REDUNDANCY SCREENS: A [] STARBOARD PBD, STARBOARD/PORT AND FORE/AFT PAYLOAD LOCATION: BAY BULKHEADS PART NUMBER: MC452-0123 CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE, TEMPERATURE, LOSS OF INPUT, VIBRATION

EFFECTS/RATIONALE:

EFFECT WOULD BE THAT THE MOTOR WOULD CONTINUE TO RUN. WITH TWO MOTORS OPERATING THE LATCHES WOULD REACHED THE OPEN POSITION, TORQUE LIMITERS WOULD SLIP WHEN LINKAGES JAM. SINGLE MOTOR DRIVE TIME WOULD BE REACHED. NO EFFECT ON MISSION OR CREW/VEHICLE.

REFERENCES: V070-594300, V070-594360, V070-594160, V070-594250, V070-594260, MC287-0040, MC287-0039

HIGHEST CRITICALITY HDW/FUNC DATE: 7/22/87 3/2R FLIGHT: SUBSYSTEM: MECH/PBD 3/2R ABORT: MDAC ID: 5117 CENTERLINE/BULKHEAD OPEN LIMIT SWITCH ITEM: FAILURE MODE: PREMATURE OPERATION SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: J. BACHER BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM PAYLOAD BAY DOORS SUBSYSTEM 2) CENTERLINE/BULKHEAD OPEN LIMIT SWICH 4) 5) 6) 7) 8) 9) CRITICALITIES HDW/FUNC HDW/FUNC ABORT FLIGHT PHASE PRELAUNCH: RTLS: TAL: LIFTOFF: 3/2R AOA: ONORBIT:

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: STARBOARD PBD, STARBOARD/PORT AND FORE/AFT PAYLOAD

3/2R

ATO:

BAY BULKHEADS

PART NUMBER: M452-0123

DEORBIT:

LANDING/SAFING:

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE, VIBRATION, SHORTED

EFFECTS/RATIONALE:

LIMIT SWITCH PREMATURELY GOING TO THE OPEN POSITION WOULD SHUT OFF A MOTOR. REDUNDANT MOTOR WOULD CONTINUE OPENING THE LATCH GANG AT A REDUCED RATE. FAILURE OF BOTH SWITCHES WOULD PREVENT PBD OPENING CAUSING LOSS OF MISSION. NO EFFECT ON CREW/VEHICLE.

REFERENCES: V070-594300, V070-594360, V070-594160, V070-594250, V070-594260, MC287-0040, MC287-0039

DATE: 7/22/87 SUBSYSTEM: MECH/PBD MDAC ID: 5118	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: /
ITEM: CENTERLINE/BULKHEA FAILURE MODE: FAILS TO SWITCH	
LEAD ANALYST: J. BACHER SUB	SSYS LEAD: H.J. LOWERY
BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) PAYLOAD BAY DOORS SUBSYSTEM 3) CENTERLINE/BULKHEAD CLOSED I 4) 5) 6) 7) 8) 9)	
	CALITIES
FLIGHT PHASE HDW/FUNC PRELAUNCH: / LIFTOFF: / ONORBIT: / DEORBIT: 3/3 LANDING/SAFING: /	ABORT HDW/FUNC RTLS: / TAL: / AOA: / ATO: /
REDUNDANCY SCREENS: A []	B [] C []
LOCATION: STARBOARD PBD, STARBAY BULKHEADS PART NUMBER: M452-0123	RBOARD/PORT AND FORE/AFT PAYLOAD
CAUSES: CONTAMINATION, MECHANICATEMPERATURE, LOSS OF INPUT, VIBRA	
EFFECTS/RATIONALE: EFFECT WOULD BE THAT THE MOTOR WO MOTORS OPERATING THE LATCHES WOUL TORQUE LIMITERS WOULD SLIP WHEN I TIME WOULD BE REACHED. NO EFFECT	D REACH THE CLOSED POSITION, LINKAGES JAM. SINGLE MOTOR DRIVE
REFERENCES: V070-594300, V070-59 V070-594260, MC287-0040, MC287-00	

HIGHEST CRITICALITY HDW/FUNC 7/22/87 DATE: FLIGHT: 2/1R SUBSYSTEM: MECH/PBD ABORT: 5119 MDAC ID: CENTERLINE/BULKHEAD CLOSED LIMIT SWITCH ITEM: FAILURE MODE: PREMATURE OPERATION SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: J. BACHER BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM PAYLOAD BAY DOORS SUBSYSTEM CENTERLINE/BULKHEAD CLOSED LIMIT SWICH 3) 4) 5) 6) 7) 8) 9) CRITICALITIES FLIGHT PHASE HDW/FUNC HDW/FUNC ABORT PRELAUNCH: RTLS: LIFTOFF: TAL: AOA: ONORBIT: ATO: DEORBIT: 2/1R LANDING/SAFING: REDUNDANCY SCREENS: A [2] B [P] C [P] STARBOARD PBD, STARBOARD/PORT AND FORE/AFT PAYLOAD LOCATION: BAY BULKHEADS PART NUMBER: M452-0123 CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE, VIBRATION, SHORTED EFFECTS/RATIONALE: LIMIT SWITCH PREMATURELY GOING TO THE CLOSED POSITION WOULD SHUT OFF A MOTOR. REDUNDANT MOTOR WOULD CONTINUE CLOSING THE LATCH GANG AT A REDUCED RATE. FAILURE OF BOTH SWITCHES WOULD PREVENT PBD CLOSURE CAUSING A POSSIBLE LOSS OF CREW/VEHICLE. AN EVA CAPABILITY IS ON HAND TO MANUALLY SECURE A FAILED LATCH.

V070-594260, MC287-0040, MC287-0039

REFERENCES: V070-594300, V070-594360, V070-594160, V070-594250,

HIGHEST CRITICALITY HDW/FUNC DATE: 7/22/87 1/1 FLIGHT: MECH/PBD SUBSYSTEM: 1/1 ABORT: 5120 MDAC ID: CENTERLINE LATCH GANG TORQUE SHAFT/COUPLINGS ITEM: FAILURE MODE: BROKEN LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM PAYLOAD BAY DOORS SUBSYSTEM CENTERLINE LATCH MECHANISM CENTERLINE LATCH GANG TORQUE SHAFT/COUPLINGS 4) 5) 6) 7) 8) 9) CRITICALITIES HDW/FUNC FLIGHT PHASE HDW/FUNC ABORT / PRELAUNCH: RTLS: TAL: LIFTOFF: 1/1 AOA: ONORBIT: 1/1 1/1 ATO: DEORBIT: LANDING/SAFING: REDUNDANCY SCREENS: A [] B [] C [] STARBOARD PBD LOCATION: PART NUMBER: V070-594345-001 TO -009, V070-594325-001, V070-594326-001, V070-594347-001, V070-594350-001, V070-59354-001 & -002, +MISC. CAUSES: MECHANICAL SHOCK, PIECE-PART FAILURE, VIBRATION, STRIPPED CROWN SPINLINE EFFECTS/RATIONALE: BROKEN TORQUE SHAFT/COUPLING WOULD PREVENT A LATCH OR TWO LATCHES FROM LATCH/UNLATCHING. WHEN OPENING PBD THIS WOULD PREVENT OPENING AND CAUSE A LOSS OF MISSION. FAILURE AFTER LATCH HOOK CLEARS ROLLER OR WHEN LATCHING PBD CLOSED COULD CAUSE A POSSIBLE LOSS OF CREW/VEHICLE. LATCH PAIR 15-16 MUST BE CLOSED TO HAVE A

REFERENCES: V070-594300, V070-594360, MC287-0040

IS LOWERED WITH A LATCH PAIR FAILED.

FACTOR OF SAFETY GREATER THAN 1. STRUCTURAL INTEGRITY OF VEHICLE

HDW/FUNC HIGHEST CRITICALITY 7/22/87 DATE: 1/1 FLIGHT: SUBSYSTEM: MECH/PBD 1/1 ABORT: 5121 MDAC ID: CENTERLINE LATCH GANG TORQUE SHAFT/COUPLINGS ITEM: FAILURE MODE: PHYSICAL BINDING/JAMMING SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: J. BACHER BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM PAYLOAD BAY DOORS SUBSYSTEM 2) CENTERLINE LATCH MECHANISM CENTERLINE LATCH GANG TORQUE SHAFT/COUPLINGS 4) 5) 6) 7) 8) 9)

CRITICALITIES HDW/FUNC HDW/FUNC ABORT FLIGHT PHASE RTLS: PRELAUNCH: / TAL: LIFTOFF: 1/1 AOA: ONORBIT: ATO: 1/1 DEORBIT: LANDING/SAFING:

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: STARBOARD PBD

PART NUMBER: V070-594345-001 TO -009, V070-594325-001, V070-594326-001, V070-594347-001, V070-594350-001, V070-59354-001 & -002, +MISC.

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE, TEMPERATURE, VIBRATION, SEIZED BUSHING, PBD WARPED

EFFECTS/RATIONALE:

BINDING/JAMMING TORQUE SHAFT/COUPLING WOULD PREVENT A LATCH OR TWO LATCHES FROM LATCH/UNLATCHING. WHEN OPENING PBD THIS WOULD PREVENT OPENING AND CAUSE A LOSS OF MISSION. FAILURE AFTER LATCH HOOK CLEARS ROLLER OR WHEN LATCHING PBD CLOSED COULD CAUSE A POSSIBLE LOSS OF CREW/VEHICLE. LATCH PAIR 15-16 MUST BE CLOSED TO HAVE A FACTOR OF SAFETY GREATER THAN 1. STRUCTURAL INTEGRITY OF VEHICLE IS LOWERED WITH A LATCH PAIR FAILED.

DATE: 7/22/87 HIGHEST CRITICALITY HDW/FUNC SUBSYSTEM: MECH/PBD FLIGHT: 1/1 MDAC ID: 5122 ABORT: 1/1 ITEM: CENTERLINE LATCH ASSEMBLY FAILURE MODE: PHYSICAL BINDING/JAMMING LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM PAYLOAD BAY DOORS SUBSYSTEM 3) CENTERLINE LATCH MECHANISM 4) CENTERLINE LATCH GANG LATCH ASSEMBLY 5) 6) 7) 8) 9) CRITICALITIES FLIGHT PHASE HDW/FUNC ABORT HDW/FUNC PRELAUNCH: RTLS: / LIFTOFF: TAL: ONORBIT: 1/1 AOA: DEORBIT: ATO: 1/1 1/1 LANDING/SAFING: REDUNDANCY SCREENS: A [] B [] C [LOCATION: STARBOARD PBD PART NUMBER: V070-594306-001, V070-594307-001 & -002, V070-594341-001, V070-594357-002 CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE, TEMPERATURE, PBD WARPED EFFECTS/RATIONALE: BINDING/JAMMING OF LATCH ASSEMBLY BEFORE LATCH OPENED WOULD PREVENT PBD OPENING CAUSING A LOSS OF MISSION. IF OCCURS AFTER LATCH HOOK CLEARED ROLLER OR WHEN CLOSING PBD THE TORQUE LIMITER WOULD SLIP DUE TO THE JAM. THIS WOULD ALSO PREVENT THE OTHER 3

REFERENCES: V070-594300, V070-594360, MC287-0040

LATCHES FROM MOVING. POSSIBLE LOSS OF CREW/VEHICLE.

DATE: 7/22/87 HIGHEST CRITICALITY HDW/FUNC SUBSYSTEM: MECH/PBD FLIGHT: 2/1R MDAC ID: 5123 ABORT: 2/1R

ITEM: CENTERLINE LATCH ASSEMBLY

FAILURE MODE: BROKEN COMPONENT

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PAYLOAD BAY DOORS SUBSYSTEM
- 3) CENTERLINE LATCH MECHANISM
- 4) CENTERLINE LATCH GANG LATCH ASSEMBLY

5)

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	·· /	RTLS:	/
LIFTOFF:	,	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	3/3	ATO:	2/1R
LANDING/SAFING	2. /		

LANDING/SAFING: /

REDUNDANCY SCREENS: A [2] B [NA] C [P]

LOCATION: STARBOARD PBD

PART NUMBER: V070-594306-001, V070-594307-001 & -002, V070-

594341-001, V070-594357-002

CAUSES: MECHANICAL SHOCK, PIECE-PART FAILURE, MATERIAL FATIGUE

EFFECTS/RATIONALE:

BROKEN LINK OR BELLCRANK WOULD PREVENT TORQUE SHAFT ROTATION FROM MOVING THE LATCH HOOK TO THE OPEN POSITION POSSIBLY PREVENTING PBD OPENING CAUSING A LOSS OF MISSION. BROKEN LINK, BELLCRANK OR LATCH WOULD PREVENT CLOSING OF A LATCH. SAFE ENTRY CAN BE MADE WITH A SINGLE LATCH NOT ENGAGED, SOME LOSS OF STRUCTURAL INTEGRITY. NO EFFECT ON CREW/VEHICLE.

HIGHEST CRITICALITY HDW/FUNC DATE: 7/22/87 MECH/PBD FLIGHT: 3/3 SUBSYSTEM: ABORT: MDAC ID: 5124 CENTERLINE LATCH ASSEMBLY ITEM: FAILURE MODE: LATCH HOOK FAILS TO ENGAGE ROLLER LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: MECHANICAL ACTUATION SYSTEM PAYLOAD BAY DOORS SUBSYSTEM 2) CENTERLINE LATCH MECHANISM 3) CENTERLINE LATCH GANG LATCH ASSEMBLY 4) 5) 6) 7) 8) 9) CRITICALITIES FLIGHT PHASE HDW/FUNC HDW/FUNC ABORT PRELAUNCH: RTLS: / LIFTOFF: TAL: ONORBIT: AOA: 3/3 DEORBIT: ATO: LANDING/SAFING: REDUNDANCY SCREENS: A [] ВΓ] C [LOCATION: STARBOARD PBD PART NUMBER: V070-594306-001, V070-594307-001 & -002, V070-594341-001, V070-594357-002 CAUSES: TEMPERATURE, MISRIGGED EFFECTS/RATIONALE: LATCH HOOK FAILING TO ENGAGE ROLLER WHEN CLOSING PBD WOULD CAUSE LOSS OF THAT LATCH. SAFE ENTRY CAN BE MADE WITH A SINGLE LATCH NOT ENGAGED, SOME LOSS OF STRUCTURAL INTEGRITY. NO EFFECT ON CREW/VEHICLE. REFERENCES: V070-594300, V070-594360, MC287-0040

HIGHEST CRITICALITY HDW/FUNC 7/22/87 DATE: FLIGHT: 2/1R

SUBSYSTEM: MECH/PBD 2/1R ABORT: MDAC ID: 5125

CENTERLINE LATCH ROLLER ASSEMBLY ITEM:

FAILURE MODE: PHYSICAL BINDING/JAMMING

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- PAYLOAD BAY DOORS SUBSYSTEM 2)
- 3) CENTERLINE LATCH MECHANISM
- 4) CENTERLINE LATCH ROLLER ASSEMBLY

5)

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	./	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	2/1R	ATO:	2/1R
LANDING/SAFING	: /		

REDUNDANCY SCREENS: A [2] B [NA] C [P]

LOCATION: PORT PBD

PART NUMBER: V070-594330-004, -005, -006

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE, TEMPERATURE

EFFECTS/RATIONALE:

BINDING/JAMMING OF THE ROLLER ASSEMBLY WHEN OPENING A LATCH CAUSES TORQUE LIMITER TO ENGAGE AND A LOSS OF MISSION WHEN PBD CANNOT BE OPENED. SAME SITUATION OCCURRING WHEN CLOSING COULD PREVENT A LATCH GANG FROM ENGAGING AND POSSIBLE LOSS OF CREW/VEHICLE. EVA CAPABILITY EXISTS TO SECURE FAILED LATCHES.

HIGHEST CRITICALITY HDW/FUNC DATE: 7/22/87 SUBSYSTEM: MECH/PBD FLIGHT: 3/3 ABORT: 3/3 5126 MDAC ID: CENTERLINE LATCH ROLLER ASSEMBLY ITEM: FAILURE MODE: BROKEN LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM PAYLOAD BAY DOORS SUBSYSTEM 2) 3) CENTERLINE LATCH MECHANISM 4) CENTERLINE LATCH ROLLER ASSEMBLY 5) 6) 7) 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE / RTLS: PRELAUNCH: / TAL: LIFTOFF: 3/3 ONORBIT: AOA: ATO: 3/3 DEORBIT: 3/3 LANDING/SAFING: / REDUNDANCY SCREENS: A [] B [] C [] PORT PBD LOCATION: PART NUMBER: V070-594330-004, -005, -006 CAUSES: MECHANICAL SHOCK, PIECE-PART FAILURE, TEMPERATURE EFFECTS/RATIONALE: BROKEN ROLLER ASSEMBLY PREVENTS HOOK ENGAGING ROLLER. RESULT IS DECREASED VEHICLE STRUCTURAL INTEGRITY DUE TO A LATCH MISSING BUT SAFE ENTRY IS POSSIBLE. NO EFFECT ON MISSION OR CREW/VEHICLE. REFERENCES: V070-594300, V070-594360, MC287-0040

HIGHEST CRITICALITY HDW/FUNC 7/22/87 DATE: 2/1R FLIGHT: SUBSYSTEM: MECH/PBD ABORT: 5127 MDAC ID: PBD SHEAR FITTING ROLLER ITEM: FAILURE MODE: FAILS TO ENGAGE CLAW SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: J. BACHER BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM PAYLOAD BAY DOORS SUBSYSTEM 2) PBD SHEAR FITTING ROLLER 3) 4) 5) 6) 7) 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE PRELAUNCH: RTLS: TAL: / LIFTOFF: AOA: / ONORBIT: 2/1R ATO: DEORBIT: LANDING/SAFING: / REDUNDANCY SCREENS: A [2] B [NA] C [F] PORT PBD LOCATION: PART NUMBER: V070-594302-001, -002, -003 CAUSES: PIECE-PART FAILURE, TEMPERATURE, MISADJUSTED EFFECTS/RATIONALE: FAILURE OF SHEAR FITTING ROLLER TO ENGAGE CLAW COULD PREVENT BPD CLOSURE. IF PBD CAN BE CLOSED IT WOULD DEGRADE STRUCTURAL INTEGRITY OF VEHICLE. POSSIBLE LOSS OF CREW/VEHICLE IF MORE THAN ONE FAILS TO ENGAGE.

DATE: 7/22/87 HIGHEST CRITICALITY HDW/FUNC SUBSYSTEM: MECH/PBD FLIGHT: 2/1R

MDAC ID: 5128 ABORT: 2/1R

ITEM: PBD SHEAR FITTING ROLLER

FAILURE MODE: BROKEN

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PAYLOAD BAY DOORS SUBSYSTEM
- 3) PBD SHEAR FITTING ROLLER

4)

5)

6) 7)

8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	./	RTLS:	/
LIFTOFF:	,	TAL:	/ .
ONORBIT:	2/1R	AOA:	/
DEORBIT:	2/1R	ATO:	2/1R
LANDING/SAFING	: /		

REDUNDANCY SCREENS: A [2] B [NA] C [P]

LOCATION: PORT PBD

PART NUMBER: V070-594302-001, -002, -003

CAUSES: MECHANICAL SHOCK, OVERLOAD, PIECE-PART FAILURE,

TEMPERATURE

EFFECTS/RATIONALE:

BROKEN ROLLER WOULD DEGRADE VEHICLE STRUCTURAL INTEGRITY. SHEAR LOAD CARRIED BY THIS FITTING WOULD BE CARRIED BY REMAINING FITTINGS. POSSIBLE LOSS OF CREW/VEHICLE IN THE EVENT OF MULTIPLE FAILURES.

DATE: 7/22/87 HIGHEST CRITICALITY HDW/FUNC SUBSYSTEM: MECH/PBD FLIGHT: 2/1R MDAC ID: 5129 ABORT: 2/1R

ITEM: PBD SHEAR FITTING ROLLER FAILURE MODE: PHYSICAL BINDING/JAMMING

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
 2) PAYLOAD BAY DOORS SUBSYSTEM
 3) PBD SHEAR FITTING ROLLER
 4)
- 5) 6) 7) 8)
- 8) 9)

CRITICALITIES

CVTTTCU		
HDW/FUNC	ABORT	HDW/FUNC
/	RTLS:	/
/	TAL:	/
2/1R	AOA:	/
2/1R	ATO:	2/1R
/		
	HDW/FUNC / / 2/1R	/ RTLS: / TAL: 2/1R AOA:

REDUNDANCY SCREENS: A [2] B [NA] C [P]

LOCATION: PORT PBD

PART NUMBER: V070-594302-001, -002, -003

CAUSES: CONTAMINATION, PIECE-PART FAILURE, TEMPERATURE

EFFECTS/RATIONALE:

BINDING/JAMMING ROLLER PREVENTS MOVEMENT OF ROLLER OUT OR INTO CLAW. LOSS OF MISSION IF PBD CANNOT BE OPENED. LOSS OF CREW/VEHICLE IF ROLLER WILL NOT ENGAGE CLAW AND STOPS DOOR CLOSURE.

HIGHEST CRITICALITY HDW/FUNC DATE: 7/22/87 SUBSYSTEM: MECH/PBD FLIGHT: 2/1R ABORT: 2/1R MDAC ID: 5130 PBD SHEAR FITTING CLAW ITEM: FAILURE MODE: FAILS TO ENGAGE ROLLER SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: J. BACHER BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM PAYLOAD BAY DOORS SUBSYSTEM 2) PBD SHEAR FITTING CLAW 3) 4) 5) 6) 7) 8) 9) CRITICALITIES HDW/FUNC HDW/FUNC FLIGHT PHASE ABORT / RTLS: PRELAUNCH: 1 LIFTOFF: TAL: 2/1R ONORBIT: AOA: ATO: 2/1R DEORBIT: 2/1R LANDING/SAFING: C [F] B [NA] REDUNDANCY SCREENS: A [2] STARBOARD PBD LOCATION: PART NUMBER: V070-59375-001, V070-594376-001, V070-594378-001 CAUSES: PIECE-PART FAILURE, TEMPERATURE, MISADJUSTED EFFECTS/RATIONALE: FAILURE OF SHEAR FITTING CLAW TO ENGAGE ROLLER COULD PREVENT PBD CLOSURE. IF PBD CAN BE CLOSED IT WOULD DEGRADE STRUCTURAL

INTEGRITY OF VEHICLE. POSSIBLE LOSS OF CREW/VEHICLE IF MORE THAN

REFERENCES: V070-594300, V070-594360, MC287-0040

ONE FAILS.

HIGHEST CRITICALITY HDW/FUNC 7/22/87 FLIGHT: 2/1R SUBSYSTEM: MECH/PBD ABORT: -2/1R MDAC ID: 5131 PBD SHEAR FITTING CLAW ITEM: FAILURE MODE: BROKEN LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM PAYLOAD BAY DOORS SUBSYSTEM 2) 3) PBD SHEAR FITTING CLAW 4) 5) 6) 7) 8) 9)

CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE RTLS: PRELAUNCH: TAL: LIFTOFF: 2/1R AOA: ONORBIT: 2/1R ATO: 2/1R DEORBIT:

LANDING/SAFING:

B [NA] C [P] REDUNDANCY SCREENS: A [2]

STARBOARD PBD LOCATION:

PART NUMBER: V070-59375-001, V070-594376-001, V070-594378-001

CAUSES: MECHANICAL SHOCK, OVERLOAD, PIECE-PART FAILURE,

TEMPERATURE

EFFECTS/RATIONALE:

BROKEN CLAW WOULD DEGRADE VEHICLE STRUCTURAL INTEGRITY. SHEAR LOAD CARRIED BY THIS FITTING WOULD CARRIED BY REMAINING FITTINGS. POSSIBLE LOSS OF CREW/VEHICLE IN THE EVENT OF MULTIPLE FAILURES.

HIGHEST CRITICALITY HDW/FUNC DATE: 7/22/87 FLIGHT: 2/1R SUBSYSTEM: MECH/PBD ~ ABORT: 2/1R MDAC ID: 5132 PBD SHEAR FITTING CLAW ITEM: FAILURE MODE: BENT LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM PAYLOAD BAY DOORS SUBSYSTEM 2) PBD SHEAR FITTING CLAW 3)

4) 5)

6) 7)

8) 9)

CRITICALITIES

FLIGHT PHASE HDW/FUNC ABORT HDW/FUNC RTLS: / PRELAUNCH: / / LIFTOFF: TAL: / AOA: 2/1R ONORBIT: ATO: 2/1R -2/1R DEORBIT: LANDING/SAFING: /

REDUNDANCY SCREENS: A [2] B [NA] C [P]

LOCATION: STARBOARD PBD

PART NUMBER: V070-59375-001, V070-594376-001, V070-594378-001

CAUSES: MECHANICAL SHOCK, OVERLOAD, PIECE-PART FAILURE

EFFECTS/RATIONALE:

BENT CLAW WOULD PREVENT PBD OPENING/CLOSING. IF ROLLER CANNOT FOLLOW NOMINAL TRAJECTORY AS PBD OPENS A JAM WOULD OCCUR RESULTING IN A LOSS OF MISSION. IF ROLLER CANNOT SEAT IN CLAW, PBD MAY BE PREVENTED FROM CLOSING. POSSIBLE LOSS OF CREW/VEHICLE.

DATE: 7/22/87 HIGHEST CRITICALITY HDW/FUNC SUBSYSTEM: MECH/PBD FLIGHT: 2/1R MDAC ID: 5133 ABORT: 2/1R

ITEM: BULKHEAD LATCH GANG BELLCRANK LINKAGE

FAILURE MODE: PHYSICAL BINDING/JAMMING

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PAYLOAD BAY DOORS SUBSYSTEM
- 3) BULKHEAD LATCH MECHANISM
- 4) BULKHEAD LATCH BELLCRANK LINKAGE

5)

6)

7)

8) 9)

CRITICALITIES

	V-1		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	7	. TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	2/1R	ATO:	2/1R
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [NA] C [P]

LOCATION: FORE/AFT PAYLOAD BAY BULKHEAD

PART NUMBER: V070-594163-001 & -002, V070-594165-001 & -002, V070594167-001, V070-594223-001, V070-594263-005 & -006, V070-594265-005 & -006, V070-594267-001 & -002, AND MISC.

CAUSES: CONTAMINATION, PIECE-PART FAILURE

EFFECTS/RATIONALE:

BINDING/JAMMING OF BELLCRANK OR LINK WOULD PREVENT PBD OPENING CAUSING A LOSS OF MISSION. IF FAILURE OCCURS AFTER LATCHES CLEAR ROLLERS OR WHEN CLOSING PBD A SAFE ENTRY IS POSSIBLE. FAILURE COULD CAUSE THE LOSS OF 1, 2 OR 3 LATCHES DEPENDING ON THE LOCATION OF THE FAILURE. NO EFFECT ON CREW/VEHICLE UNLESS TWO GANGS FAIL. VEHICLE LOSES SOME STRUCTURAL INTEGRITY WITH ONE GANG FAILED.

7/22/87 HIGHEST CRITICALITY HDW/FUNC DATE: 2/1R FLIGHT: SUBSYSTEM: MECH/PBD 2/1R ABORT: MDAC ID: 5134

ITEM: BULKHEAD LATCH GANG BELLCRANK LINKAGE

FAILURE MODE: BROKEN

SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: J. BACHER

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PAYLOAD BAY DOORS SUBSYSTEM
- 3) BULKHEAD LATCH MECHANISM
- BULKHEAD LATCH BELLCRANK LINKAGE 4)

5)

6) 7)

8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	7.	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	2/1R	ATO:	2/1R
LANDING/SAFING:	: /		

REDUNDANCY SCREENS: A [2] B [NA] C [P]

FORE/AFT PAYLOAD BAY BULKHEAD LOCATION:

PART NUMBER: V070-594163-001 & -002, V070-594165-001 & -002, V070594167-001, V070-594223-001, V070-594263-005 & -006, V070-594265-005 & -006, V070-594267-001 & -002, AND MISC.

CAUSES: MECHANICAL SHOCK, OVERLOAD, PIECE-PART FAILURE

EFFECTS/RATIONALE:

BROKEN BELLCRANK, LINK OR ASSOCIATED HARDWARE WOULD PREVENT PBD OPENING CAUSING A LOSS OF MISSION. IF FAILURE OCCURS AFTER LATCHES CLEAR ROLLERS OR WHEN CLOSING PBD A SAFE ENTRY IS POSSIBLE. FAILURE COULD CAUSE THE LOSS OF 1, 2 OR 3 LATCHES DEPENDING

ON THE LOCATION OF THE FAILURE. NO EFFECT ON CREW/VEHICLE UNLESS TWO GANGS FAIL. VEHICLE LOSES SOME STRUCTURAL INTEGRITY WITH ONE GANG FAILED.

DATE: 7/22/87 HIGHEST CRITICALITY HDW/FUNC SUBSYSTEM: MECH/PBD FLIGHT: 2/1R MDAC ID: 5135 ABORT: 2/1R

ITEM: BULKHEAD PUSH-PULL ROD FAILURE MODE: PHYSICAL BINDING/JAMMING

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PAYLOAD BAY DOORS SUBSYSTEM
- 3) BULKHEAD LATCH MECHANISM
- 4) BULKHEAD PUSH-PULL ROD

5)

6)

7)

8) 9)

CRITICALITIES

HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE / RTLS: PRELAUNCH: / TAL: LIFTOFF: 2/1R AOA: ONORBIT: ATO: 2/1R 2/1R DEORBIT: LANDING/SAFING:

REDUNDANCY SCREENS: A [2] B [NA] C [P]

LOCATION: FORE/AFT PAYLOAD BAY BULKHEAD

PART NUMBER: V070-594220, AND MISC.

CAUSES: CONTAMINATION, PIECE-PART FAILURE

EFFECTS/RATIONALE:

BINDING/JAMMING OF PUSHROD WOULD PREVENT PBD OPENING CAUSING A LOSS OF MISSION. IF FAILURE OCCURS AFTER LATCHES CLEAR ROLLERS OR WHEN CLOSING PBD A SAFE ENTRY IS POSSIBLE. FAILURE COULD CAUSE THE LOSS OF 1, 2 OR 3 LATCHES DEPENDING ON THE LOCATION OF THE FAILURE. NO EFFECT ON CREW/VEHICLE UNLESS TWO GANGS FAIL. VEHICLE LOSES SOME STRUCTURAL INTEGRITY WITH ONE GANG FAILED.

HIGHEST CRITICALITY HDW/FUNC 7/22/87 DATE: 2/1R SUBSYSTEM: MECH/PBD FLIGHT:

MDAC ID: 5136 ABORT: 2/1R

BULKHEAD PUSH-PULL ROD

FAILURE MODE: BROKEN

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PAYLOAD BAY DOORS SUBSYSTEM
- 3) BULKHEAD LATCH MECHANISM
- 4) BULKHEAD PUSH-PULL ROD

5)

6)

7)

8) 9)

CRITICALITIES

HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE RTLS: TAL: AOA: ATO: / / PRELAUNCH: / LIFTOFF: 2/1R ONORBIT: DEORBIT: 2/1R 2/1R LANDING/SAFING: /

REDUNDANCY SCREENS: A [2] B [NA] C [P]

FORE/AFT PAYLOAD BAY BULKHEAD LOCATION:

PART NUMBER: V070-594220, AND MISC.

CAUSES: MECHANICAL SHOCK, OVERLOAD, PIECE-PART FAILURE

EFFECTS/RATIONALE:

BROKEN PUSHROD OR ASSOCIATED HARDWARE WOULD PREVENT PBD OPENING CAUSING A LOSS OF MISSION. IF FAILURE OCCURS AFTER LATCHES CLEAR ROLLERS OR WHEN CLOSING PBD A SAFE ENTRY IS POSSIBLE. FAILURE COULD CAUSE THE LOSS OF 1, 2 OR 3 LATCHES DEPENDING ON THE LOCATION OF THE FAILURE. NO EFFECT ON CREW/VEHICLE UNLESS TWO GANGS FAIL. VEHICLE LOSES SOME STRUCTURAL INTEGRITY WITH ONE GANG FAILED.

DATE: 7/22/87 HIGHEST CRITICALITY HDW/FUNC SUBSYSTEM: MECH/PBD FLIGHT: 2/1R MDAC ID: 5137 ABORT: 2/1R

ITEM: BULKHEAD LATCH LINKAGE
FAILURE MODE: PHYSICAL BINDING/JAMMING

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PAYLOAD BAY DOORS SUBSYSTEM
- 3) BULKHEAD LATCH MECHANISM
- 4) BULKHEAD LATCH LINKAGE

5)

6)

7)

8) 91

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	2/1R	ATO:	2/1R
LANDING/SAFI	NG: /		

REDUNDANCY SCREENS: A [2] B [NA] C [P]

LOCATION: FORE/AFT PAYLOAD BAY BULKHEAD
PART NUMBER: V070-594280, V070-594276 THRU V070-594279, V070594281 THRU V070-594284, V070-594314, V070-594315, V070-594319, V070-594316, V070-594317, V070-594320

CAUSES: MECHANICAL SHOCK, OVERLOAD, PIECE-PART FAILURE, CONTAMINATION

EFFECTS/RATIONALE:

BINDING/JAMMING OF LATCHING BELLCRANK, LINK OR HOOK WOULD PREVENT PBD OPENING CAUSING A LOSS OF MISSION. IF FAILURE OCCURS AFTER LATCHES CLEAR ROLLERS OR WHEN CLOSING PBD A SAFE ENTRY IS POSSIBLE. FAILURE COULD CAUSE LOSS OF 1, 2, 3 OR 4 LATCHES DEPENDING ON THE LOCATION OF THE FAILURE. NO EFFECT ON CREW/VEHICLE UNLESS TWO GANGS FAIL. VEHICLE LOSES SOME STRUCTURAL INTEGRITY WITH ONE GANG FAILED.

HIGHEST CRITICALITY HDW/FUNC 7/22/87 DATE: FLIGHT: SUBSYSTEM: MECH/PBD 2/1R 2/1R ABORT: 5138

MDAC ID:

BULKHEAD LATCH LINKAGE

FAILURE MODE: BROKEN

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- PAYLOAD BAY DOORS SUBSYSTEM 2)
- BULKHEAD LATCH MECHANISM
- 4) BULKHEAD LATCH LINKAGE

5)

ITEM:

6)

7)

8) 9)

CRITICALITIES

HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE RTLS: PRELAUNCH: / . TAL: LIFTOFF: 2/1R AOA: ONORBIT: ATO: 2/1R DEORBIT: 2/1R LANDING/SAFING: /

REDUNDANCY SCREENS: A [2] B [NA] C [P]

FORE/AFT PAYLOAD BAY BULKHEAD LOCATION:

PART NUMBER: V070-594280, V070-594276 THRU V070-594279, V070-594281 THRU V070-594284, V070-594314, V070-594315, V070-594319, V070-594316, V070-594317, V070-594320

CAUSES: MECHANICAL SHOCK, OVERLOAD, PIECE-PART FAILURE

EFFECTS/RATIONALE:

BROKEN BELLCRANK, LINK OR HOOK WOULD PREVENT PBD OPENING CAUSING A LOSS OF MISSION. IF FAILURE OCCURS AFTER LATCHES CLEAR ROLLERS OR WHEN CLOSING PBD A SAFE ENTRY IS POSSIBLE. FAILURE COULD CAUSE LOSS OF 1, 2, 3 OR 4 LATCHES DEPENDING ON THE LOCATION OF THE FAILURE. NO EFFECT ON CREW/VEHICLE UNLESS TWO BANGS FAIL. VEHICLE LOSES SOME STRUCTURAL INTEGRITY WITH ONE GANG FAILED.

HIGHEST CRITICALITY HDW/FUNC DATE: 7/22/87 2/1R SUBSYSTEM: MECH/PBD FLIGHT: ABORT: MDAC ID: 5139 BULKHEAD LATCH LINKAGE ITEM: FAILURE MODE: FAILS TO LATCH LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: MECHANICAL ACTUATION SYSTEM 1) PAYLOAD BAY DOORS SUBSYSTEM 2) BULKHEAD LATCH MECHANISM 3) BULKHEAD LATCH LINKAGE 4) 5) 6) 7) 8) 9) CRITICALITIES HDW/FUNC HDW/FUNC ABORT FLIGHT PHASE PRELAUNCH: RTLS: / TAL: LIFTOFF: AOA: ONORBIT:

REDUNDANCY SCREENS: A [2] B [NA] C [P]

2/1R

LOCATION: FORE/AFT PAYLOAD BAY BULKHEAD
PART NUMBER: V070-594280, V070-594276 THRU V070-594279, V070594281 THRU V070-594284, V070-594314, V070-594315, V070-594319, V070-594316, V070-594317, V070-594320

ATO:

CAUSES: MECHANICAL SHOCK, PIECE-PART FAILURE, TEMPERATURE, MISRIGGED

EFFECTS/RATIONALE:

DEORBIT:

LANDING/SAFING:

FAILURE TO LATCH REDUCES STRUCTURAL INTEGRITY OF THE VEHICLE. AN ENTIRE BULKHEAD LATCH GANG CAN FAIL BUT STILL ALLOW A SAFE ENTRY. NO EFFECT ON CREW/VEHICLE.

HIGHEST CRITICALITY HDW/FUNC DATE: 7/22/87 FLIGHT: SUBSYSTEM: MECH/PBD 2/1R ABORT: 2/1R MDAC ID: 5140 BULKHEAD ROLLER ASSEMBLY FAILURE MODE: PHYSICAL BINDING/JAMMING LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY:

1) MECHANICAL ACTUATION SYSTEM 2) PAYLOAD BAY DOORS SUBSYSTEM 3) BULKHEAD LATCH MECHANISM 4) BULKHEAD ROLLER ASSEMBLY 5) 6) 7) 8)

CRITICALITIES

HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE RTLS: TAL: AOA: ATO: / PRELAUNCH: / LIFTOFF: 2/1R ONORBIT: DEORBIT: 2/1R 2/1R LANDING/SAFING: /

REDUNDANCY SCREENS: A [2] B [NA] C [P]

LOCATION: FORE/AFT PAYLOAD BAY BULKHEAD PART NUMBER: V070-594180, V070-594280

CAUSES: CONTAMINATION, PIECE-PART FAILURE, TEMPERATURE,

MISADJUSTED

9)

EFFECTS/RATIONALE: BINDING/JAMMING OF A BULKHEAD COULD POSSIBLY PREVENT PBD OPEN/CLOSING. FAILURE COULD PREVENT A SECURE LATCH OF HOOK WITH ROLLER WHEN FORCE CAUSES TORQUE LIMITER TO SLIP. SAFE ENTRY CAN BE MADE WITH A GANG FAILED. NO EFFECT ON CREW/VEHICLE.

HIGHEST CRITICALITY HDW/FUNC 7/22/87 DATE: 3/3 FLIGHT: SUBSYSTEM: MECH/PBD 3/3 ABORT: MDAC ID: 5141 BULKHEAD ROLLER ASSEMBLY ITEM: FAILURE MODE: BROKEN FROM BULKHEAD SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: J. BACHER BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) PAYLOAD BAY DOORS SUBSYSTEM 3) BULKHEAD LATCH MECHANISM 4) BULKHEAD ROLLER ASSEMBLY 5) 6) 7) 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE RTLS: PRELAUNCH: / / TAL: LIFTOFF: 3/3 AOA: ONORBIT: ATO: 3/3 DEORBIT: 3/3 LANDING/SAFING: REDUNDANCY SCREENS: A [] B [] C [] FORE/AFT PAYLOAD BAY BULKHEAD LOCATION: PART NUMBER: V070-594180, V070-594280 CAUSES: MECHANICAL SHOCK, OVERLOAD, PIECE-PART FAILURE, TEMPERATURE EFFECTS/RATIONALE: THE LOSS OF A ROLLER ASSEMBLY WOULD INCREASE THE LOAD ON THE

REFERENCES: V070-594160, V070-594250, V070-594260, MC287-0039

REMAINING ROLLERS. NO EFFECT ON CREW/VEHICLE OR MISSION.

DATE: SUBSYSTEM: MI MDAC ID: 5	7/22/87 ECH/PBD 142		HIGHEST	CRITICALITY FLIGHT: ABORT:	HDW/FUNC 3/3 /
ITEM: FAILURE MODE:	BULKHEA FAILS T	D DOOR CLOSED SWITCH	SWITCH		
LEAD ANALYST:	J. BACHE	R SUBSY	S LEAD: H	.J. LOWERY	
BREAKDOWN HIE 1) MECHANIC 2) PAYLOAD 3) BULKHEAD 4) BULKHEAD 5) 6) 7) 8)	AL ACTUAT	CION SYSTEM CHANISM SED SWITCH			
		CRITICAL	ITIES		
PRELAU LIFTOF: ONORBI' DEORBI'	NCH:	HDW/FUNC / / 3/3	ABORT RTI TAI AOA ATO	.s: / / .: /	C
REDUNDANCY SC	REENS:	A []	в []	c []	•
LOCATION: PART NUMBER: CAUSES: CONT. TEMPERATURE, EFFECTS/RATION MOTOR WOULD COREACHED. TOR CLOSED POSITION	AMINATION LOSS OF I NALE: ONTINUE T QUE LIMIT	, MECHANICAL NPUT O RUN TILL SI	SHOCK, PI NGLE MOTO N SLIPPIN	OR DRIVE TIME	LIMIT
			÷		

HIGHEST CRITICALITY HDW/FUNC 7/22/87 DATE: 2/1R FLIGHT: SUBSYSTEM: MECH/PBD ABORT: MDAC ID: 5143 BULKHEAD DOOR CLOSED SWITCH ITEM: FAILURE MODE: PREMATURE OPERATION LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM PAYLOAD BAY DOORS SUBSYSTEM 3) BULKHEAD LATCH MECHANISM BULKHEAD DOOR CLOSED SWITCH 4) 5) 6) 7) 8) 9) CRITICALITIES HDW/FUNC ABORT FLIGHT PHASE HDW/FUNC RTLS: PRELAUNCH: / / TAL: LIFTOFF: AOA: ONORBIT: 2/1R · ATO: DEORBIT:

REDUNDANCY SCREENS: A [2] B [P] C [P]

/

LOCATION: FORE/AFT PAYLOAD BAY BULKHEAD

PART NUMBER: V070-594222

LANDING/SAFING:

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE, VIBRATION

EFFECTS/RATIONALE:

DOOR CLOSED SWITCH PREMATURELY GOING TO THE CLOSED POSITION WOULD SHUT OFF A MOTOR. REDUNDANT MOTOR WOULD CONTINUE CLOSING THE PBD AT A REDUCED RATE. FAILURE OF BOTH SWITCHES WOULD PREVENT COMPLETE PBD CLOSURE AND LATCHING WITH POSSIBLE LOSS OF CREW/VEHICLE.

REFERENCES: V070-594160, V070-594250, V070-594260, MC287-0039

HIGHEST CRITICALITY HDW/FUNC 7/22/87 DATE: FLIGHT: 3/3 SUBSYSTEM: MECH/PBD 5144 ABORT: / MDAC ID: BULKHEAD READY-TO-LATCH SWITCH MODULE ITEM: FAILURE MODE: FAILS TO SWITCH LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) PAYLOAD BAY DOORS SUBSYSTEM 3) BULKHEAD LATCH MECHANISM 4) BULKHEAD READY-TO-LATCH SWITCH MODULE 5) 6) 7) 8) 9) CRITICALITIES HDW/FUNC ABORT FLIGHT PHASE HDW/FUNC PRELAUNCH: RTLS: / / TAL: / LIFTOFF: AOA: ONORBIT: ATO: DEORBIT: 3/3 LANDING/SAFING: REDUNDANCY SCREENS: A [] B [] C [FORE/AFT PAYLOAD BAY BULKHEAD LOCATION: PART NUMBER: V070-594222 CAUSES: MECHANICAL SHOCK, PIECE-PART FAILURE, MISADJUSTED EFFECTS/RATIONALE: FAILURE OF READY-TO-LATCH SWITCH MODULE WOULD PREVENT A BULKHEAD LATCH GANG FROM ENGAGING THE BULKHEAD ROLLERS AND CLOSING THE PBD. THIS FAILURE WOULD CAUSE A CRT MESSAGE TO ALERT THE CREW. MANUAL PROCEDURE CAN THEN CLOSE PBD. A SAFE ENTRY IS WITH A BULKHEAD GANG UNLATCHED. NO EFFECT ON CREW/VEHICLE.

HIGHEST CRITICALITY HDW/FUNC 7/22/87 DATE: 2/1R FLIGHT: SUBSYSTEM: MECH/PBD ABORT: 5145 MDAC ID: BULKHEAD READY-TO-LATCH SWITCH MODULE ITEM: FAILURE MODE: PREMATURE OPERATION SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: J. BACHER BREAKDOWN HIERARCHY: MECHANICAL ACTUATION SYSTEM PAYLOAD BAY DOORS SUBSYSTEM 3) BULKHEAD LATCH MECHANISM BULKHEAD READY-TO-LATCH SWITCH MODULE 4) 5) 6) 7) 8) 9) CRITICALITIES

FLIGHT PHASE HDW/FUNC ABORT HDW/FUNC PRELAUNCH: / RTLS: / LIFTOFF: / TAL: / ONORBIT: / AOA: / DEORBIT: 2/1R ATO: /

LANDING/SAFING: /

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: FORE/AFT PAYLOAD BAY BULKHEAD

PART NUMBER: V070-594222

CAUSES: CONTAMINATION, PIECE-PART FAILURE, TEMPERATURE, VIBRATION, INADVERTENT OPERATION, MISADJUSTED

EFFECTS/RATIONALE:

PREMATURE SWITCHING BY THE READY-TO-LATCH MODULE WOULD CAUSE A PREMATURE ATTEMPT TO LATCH. COULD POSSIBLY INTERFERE WITH CLOSING PBD. IF THERE IS NO INTERFERENCE THE LOSS OF A LATCH GANG REDUCES VEHICLE STRUCTURAL INTEGRITY BUT A SAFE ENTRY CAN BE ACCOMPLISHED.

REFERENCES: V070-594160, V070-594250, V070-594260, MC287-0039

DATE:

7/22/87

HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: MECH/PBD

FLIGHT:

2/1R

MDAC ID:

5146

ABORT:

2/1R

ITEM:

PAYLOAD BAY DOOR DRIVE MOTOR

FAILURE MODE: LOSS OF OUTPUT

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- PAYLOAD BAY DOORS SUBSYSTEM
- 3) PAYLOAD BAY DOOR DRIVE MECHANISM
- 4) PAYLOAD BAY DOOR DRIVE MOTOR

5)

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE HDW/FUNC ABORT HDW/FUNC RTLS: PRELAUNCH: / / TAL: LIFTOFF: 2/1R ONORBIT: AOA: 2/1R DEORBIT: ATO: 2/1R LANDING/SAFING: /

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION:

STARBOARD/PORT PBD

PART NUMBER: MC162-0008-0004

CAUSES: MECHANICAL SHOCK, PIECE-PART FAILURE, TEMPERATURE, LOSS

OF INPUT

EFFECTS/RATIONALE:

THE LOSS A PBD DRIVE MOTOR CAUSES THE OPEN/CLOSING OF THE PBD AT A REDUCED RATE BY THE REDUNDANT MOTOR. LOSS OF MISSION WOULD ONLY HAPPEN IF BOTH MOTORS FAIL WHEN OPENING THE PBD. POSSIBLE LOSS OF CREW/VEHICLE UPON FAILURE OF BOTH MOTORS AND UNABLE TO PERFORM EVA CLOSING OF PBD.

HIGHEST CRITICALITY HDW/FUNC DATE: 7/22/87 FLIGHT: 2/1R SUBSYSTEM: MECH/PBD 2/1R ABORT: 5147 MDAC ID: PAYLOAD BAY DOOR DRIVE CLUTCH ITEM: FAILURE MODE: FAILS TO ENGAGE SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: J. BACHER BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM PAYLOAD BAY DOORS SUBSYSTEM 2) PAYLOAD BAY DOOR DRIVE MECHANISM 3) PAYLOAD BAY DOOR DRIVE CLUTCH 4) 5) 6)

CRITICALITIES

CUTTICU		
HDW/FUNC	ABORT	HDW/FUNC
/	RTLS:	/
./	TAL:	/
2/1R	AOA:	/
2/1R	ATO:	2/1R
G: /		
	HDW/FUNC / 2/1R 2/1R	/ RTLS: / TAL: 2/1R AOA: 2/1R ATO:

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: STARBOARD/PORT PBD PART NUMBER: MC162-0008-0004

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE, TEMPERATURE, LOSS OF INPUT, VIBRATION

EFFECTS/RATIONALE:

7) 8) 9)

FAILURE OF CLUTCH TO ENGAGE WHEN POWER IS APPLIED WOULD PREVENT THE MOTOR SHAFT FROM ROTATING. REDUNDANT MOTOR WOULD COMPLETE OPEN/CLOSING OF PBD BUT AT A SLOWER RATE.

HIGHEST CRITICALITY HDW/FUNC 7/22/87 SUBSYSTEM: MECH/PBD FLIGHT: 3/3 3/3 ABORT: MDAC ID: 5148 PAYLOAD BAY DOOR DRIVE CLUTCH ITEM: FAILURE MODE: FAILS TO DISENGAGE SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: J. BACHER BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM PAYLOAD BAY DOORS SUBSYSTEM 2) PAYLOAD BAY DOOR DRIVE MECHANISM 3) PAYLOAD BAY DOOR DRIVE CLUTCH 4) 5) 6) 7) 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE PRELAUNCH: / RTLS: / TAL: LIFTOFF: 3/3 AOA: ONORBIT: 3/3 DEORBIT: ATO: 3/3 LANDING/SAFING: REDUNDANCY SCREENS: A [] B [] C [] LOCATION: STARBOARD/PORT PBD PART NUMBER: MC162-0008-0004 CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE, TEMPERATURE, VIBRATION EFFECTS/RATIONALE: FAILURE OF THE CLUTCH TO DISENGAGE WOULD ALLOW THE MOTOR SHAFT TO ROTATE INSTEAD OF BEING STOPPED. SINCE THIS OCCURS AFTER OPEN/CLOSING OF PBD THIS HAS MINIMAL IMPACT. THE FAILURE WOULD BE IMPORTANT IF THE ASSOCIATED MOTOR ALSO WERE TO FAIL. THIS WOULD CAUSE A LOSS OF OUTPUT FROM THE DIFFERENTIAL AND PBD OPEN/CLOSE. REFERENCES: V070-594125

DATE: 7/22/87 HIGHEST CRITICALITY HDW/FUNC SUBSYSTEM: MECH/PBD FLIGHT: 2/1R MDAC ID: 5149 ABORT: 2/1R

ITEM: PAYLOAD BAY DOOR DRIVE BRAKE

FAILURE MODE: FAILS TO DISENGAGE

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PAYLOAD BAY DOORS SUBSYSTEM
- 3) PAYLOAD BAY DOOR DRIVE MECHANISM
- 4) PAYLOAD BAY DOOR DRIVE BRAKE

5)

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	,	RTLS:	/
LIFTOFF:	,	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	2/1R	ATO:	2/1R
TANDING/SAFT	NG: /		

LANDING/SAFING: /

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: STARBOARD/PORT PBD PART NUMBER: MC162-0008-0004

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE, TEMPERATURE, LOSS OF INPUT, VIBRATION

EFFECTS/RATIONALE:

FAILURE OF BRAKE TO DISENGAGE WHEN POWER IS APPLIED WOULD PREVENT THE MOTOR SHAFT FROM ROTATING. REDUNDANT MOTOR WOULD COMPLETE OPEN/CLOSING OF THE PBD BUT AT A SLOWER RATE.

HIGHEST CRITICALITY HDW/FUNC DATE: 7/22/87 MECH/PBD FLIGHT: 3/3 SUBSYSTEM: ABORT: 3/3 MDAC ID: 5150 PAYLOAD BAY DOOR DRIVE BRAKE TTEM: FAILURE MODE: FAILS TO ENGAGE LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM PAYLOAD BAY DOORS SUBSYSTEM 2) PAYLOAD BAY DOOR DRIVE MECHANISM 4) PAYLOAD BAY DOOR DRIVE BRAKE 5) 6) 7) 8) 9) CRITICALITIES FLIGHT PHASE HDW/FUNC ABORT HDW/FUNC PRELAUNCH: RTLS: / / TAL: LIFTOFF: 3/3 AOA: ONORBIT: 3/3 DEORBIT: 3/3 ATO: LANDING/SAFING: B [] C [REDUNDANCY SCREENS: A [] LOCATION: STARBOARD/PORT PBD PART NUMBER: MC162-0008-0004 CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE, TEMPERATURE, LOSS OF INPUT, VIBRATION EFFECTS/RATIONALE: FAILURE OF BRAKE TO ENGAGE WOULD ALLOW THE MOTOR SHAFT TO ROTATE INSTEAD OF BEING LOCKED. SINCE THIS OCCURS AFTER OPEN/CLOSING OF PBD THIS HAS MINIMAL IMPACT. THE FAILURE WOULD BE IMPORTANT IF THE ASSOCIATED MOTOR ALSO WERE TO FAIL. THIS WOULD CAUSE A

REFERENCES: V070-594125

LOSS OF OUTPUT FROM THE DIFFERENTIAL AND PBD OPEN/CLOSE.

DATE: 7/22/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: MECH/PBD FLIGHT: 2/1R MDAC ID: 5151 ABORT: 2/1R

ITEM: PAYLOAD BAY DOOR DRIVE CLUTCH/BRAKE DISC

FAILURE MODE: SLIPS

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PAYLOAD BAY DOORS SUBSYSTEM
- 3) PAYLOAD BAY DOOR DRIVE MECHANISM
- 4) PAYLOAD BAY DOOR DRIVE CLUTCH/BRAKE DISC

5)

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	,	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	2/1R	ATO:	2/1R
LANDING/SAFING	: /		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: STARBOARD/PORT PBD PART NUMBER: MC162-0008-0004

CAUSES: CONTAMINATION, TEMPERATURE

EFFECTS/RATIONALE:

SLIPPING OF THE CLUTCH/BRAKE DISC WOULD REDUCE THE INPUT TO THE DIFFERENTIAL AND THE RATE OF PBD OPEN/CLOSING. REDUNDANT MOTOR WOULD SUPPLY OPEN/CLOSING POWER. LOSS OF MOTOR ALONG WITH CLUTCH/BRAKE DISC SLIPPAGE WOULD PERMIT BACKDRIVING BY REMAINING MOTOR, NO OUTPUT FROM THE DIFFERENTIAL AND POSSIBLE LOSS OF MISSION OR CREW/VEHICLE.

7/22/87 HIGHEST CRITICALITY HDW/FUNC DATE: FLIGHT: 1/1 SUBSYSTEM: MECH/PBD 1/1 MDAC ID: 5152 ABORT: PAYLOAD BAY DOOR DRIVE DIFFERENTIAL ITEM: FAILURE MODE: LOSS OF OUTPUT LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) PAYLOAD BAY DOORS SUBSYSTEM 3) PAYLOAD BAY DOOR DRIVE MECHANISM 4) PAYLOAD BAY DOOR DRIVE DIFFERENTIAL 5) 6) 7) 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE RTLS: PRELAUNCH: / / / TAL: / LIFTOFF: 1/1 AOA: ONORBIT: ATO: 1/1 DEORBIT: 1/1 LANDING/SAFING: / REDUNDANCY SCREENS: A [] B [] C [] LOCATION: STARBOARD/PORT PBD PART NUMBER: MC162-0008-0004 CAUSES: MECHANICAL SHOCK, PIECE-PART FAILURE, TEMPERATURE, LOSS OF INPUT, VIBRATION EFFECTS/RATIONALE: UNABLE TO OPEN/CLOSE PBD. IF UNABLE TO OPEN THE PBD THEN A LOSS OF MISSION RESULTS. IF UNABLE TO CLOSE THE PBD THEN A SAFE ENTRY CANNOT BE MADE. AN EVA, THE UNLIKE REDUNDANCY, WOULD BE NECESSARY TO CLOSE THE PBD.

HIGHEST CRITICALITY HDW/FUNC 7/22/87 DATE: FLIGHT: 2/2 SUBSYSTEM: MECH/PBD ABORT: 2/2 5153 MDAC ID: PAYLOAD BAY DOOR DRIVE DIFFERENTIAL ITEM: FAILURE MODE: PARTIAL OUTPUT LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) PAYLOAD BAY DOORS SUBSYSTEM 3) PAYLOAD BAY DOOR DRIVE MECHANISM 4) PAYLOAD BAY DOOR DRIVE DIFFERENTIAL 5) 6)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/2	AOA:	1.
DEORBIT:	3/3	ATO:	2/2
LANDING/SAFIN	IG: /		

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: STARBOARD/PORT PBD PART NUMBER: MC162-0008-0004

CAUSES: CONTAMINATION, PIECE-PART FAILURE, TEMPERATURE, PARTIAL INPUT

EFFECTS/RATIONALE:

7) 8) 9)

IF OUTPUT OF TORQUE FROM THE DIFFERENTIAL WERE LOW ENOUGH THE SINGLE MOTOR DRIVE TIME LIMIT WOULD BE HIT. THE CREW HAS VISUAL CUES OF PBD MOVEMENT AND POSITION. POSSIBLE LOSS OF MISSION IF FAILURE OCCURS WHEN OPENING PBD. ON CLOSING OF THE PBD FLIGHT RULES ALLOW DRIVING BEYOND SINGLE MOTOR DRIVE TIME BECAUSE VISUAL CUE EXISTS.

REFERENCES: V070-594125, FLIGHT RULES SECTION 10-MMACS

7/22/87 HIGHEST CRITICALITY HDW/FUNC DATE: FLIGHT: 1/1 SUBSYSTEM: MECH/PBD 1/1 MDAC ID: 5154 ABORT: PAYLOAD BAY DOOR DRIVE DIFFERENTIAL ITEM: FAILURE MODE: PHYSICAL BINDING/JAMMING -----LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) PAYLOAD BAY DOORS SUBSYSTEM 3) PAYLOAD BAY DOOR DRIVE MECHANISM 4) PAYLOAD BAY DOOR DRIVE DIFFERENTIAL 5) 6) 7) 8) 9) CRITICALITIES FLIGHT PHASE HDW/FUNC ABORT HDW/FUNC RTLS: TAL: AOA: ATO: PRELAUNCH: / LIFTOFF: 1/1 ONORBIT: DEORBIT: 1/1 1/1 LANDING/SAFING: / REDUNDANCY SCREENS: A [] B [] C [] LOCATION: STARBOARD/PORT PBD PART NUMBER: MC162-0008-0004 CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE, TEMPERATURE, VIBRATION EFFECTS/RATIONALE: BINDING/JAMMING WOULD PREVENT PBD OPEN/CLOSING. FAILURE WHEN OPENING THE PBD CAUSES A LOSS OF MISSION. IF UNABLE TO CLOSE THE PBD THEN AN UNSAFE CONDITION WOULD EXIST FOR ENTRY. AN EVA PROCEDURE EXISTS TO CLOSE THE PBD. POSSIBLE LOSS OF CREW/VEHICLE IF PBD NOT SECURED CLOSE.

HIGHEST CRITICALITY HDW/FUNC DATE: 7/22/87 1/1 SUBSYSTEM: MECH/PBD FLIGHT: 1/1 ABORT: MDAC ID: 5155 PAYLOAD BAY DOOR DRIVE GEARBOX ITEM: FAILURE MODE: FAILS TO OPERATE SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: J. BACHER BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM PAYLOAD BAY DOORS SUBSYSTEM 2) PAYLOAD BAY DOOR DRIVE MECHANISM 3) PAYLOAD BAY DOOR DRIVE GEARBOX 4) 5) 6) 7) 8) 9) CRITICALITIES HDW/FUNC HDW/FUNC FLIGHT PHASE ABORT / RTLS: PRELAUNCH: TAL: LIFTOFF: 1/1 AOA: ONORBIT: 1/1 1/1 ATO: DEORBIT: LANDING/SAFING: C [] REDUNDANCY SCREENS: B [] A [] STARBOARD/PORT PBD LOCATION:

PART NUMBER: MC162-0008-0004

CAUSES: MECHANICAL SHOCK, OVERLOAD, PIECE-PART FAILURE, TEMPERATURE, VIBRATION

EFFECTS/RATIONALE:

GEARBOX FAILURE CAUSES NO TORQUE TRANSFER TO THE PBD TORQUE SHAFT AND ROTARY ACTUATORS. PBD STOPS MOVEMENT, FAILS CLOSED, OPEN OR IN TRANSIT. LOSS OF MISSION WOULD OCCUR IF PBD COULD NOT BE OPENED FAR ENOUGH. LOSS OF CREW/VEHICLE COULD OCCUR IF PBD COULD NOT BE CLOSED. AN EVA PROCEDURE EXISTS FOR MANUAL CLOSURE OF PBD.

DATE: 7/22/87 SUBSYSTEM: MECH/PBD MDAC ID: 5156	•	HIGHEST CRI F A	TICALITY ILIGHT: ABORT:	1/1
ITEM: PAYLOA FAILURE MODE: PHYSIC	D BAY DOOR DRI	MTNC		
LEAD ANALYST: J. BACH	ER SUBS	S LEAD: H.J.	LOWERY	
BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUA 2) PAYLOAD BAY DOOR 3) PAYLOAD BAY DOOR 4) PAYLOAD BAY DOOR 5) 6) 7) 8)	S SUBSYSTEM DRIVE MECHAN]			g an
	CRITICAL	LITIES		
FLIGHT PHASE PRELAUNCH: LIFTOFF: ONORBIT: DEORBIT: LANDING/SAFING	1/1 1/1	ABORT RTLS: TAL: AOA: ATO:	HDW/FUNC / / 1/1	
REDUNDANCY SCREENS:	A []	В []	c []	
LOCATION: STARBOA PART NUMBER: MC162-0				
CAUSES: CONTAMINATIO FAILURE, TEMPERATURE	N, MECHANICAL	SHOCK, OVERL	OAD, PIECE-	-PART
EFFECTS/RATIONALE: BINDING/JAMMING CAUSE ACTUATOR TO SLIP. PB TRANSIT. LOSS OF MIS FAR ENOUGH. LOSS OF COULD NOT BE CLOSED. OF PBD.	D STOPS MOVEME SION WOULD OCC CREW/VEHICLE O	INT, FAILS CL FUR IF PBD CO COULD OCCUR I	OSED, OPEN ULD NOT BE F PBD	OR IN OPENED
REFERENCES: V070-594	125			

HIGHEST CRITICALITY HDW/FUNC 7/22/87 FLIGHT: 2/2 SUBSYSTEM: MECH/PBD 2/2 ABORT: 5157 MDAC ID: PAYLOAD BAY DOOR DRIVE GEARBOX FAILURE MODE: PARTIAL OUTPUT LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM PAYLOAD BAY DOORS SUBSYSTEM 3) PAYLOAD BAY DOOR DRIVE MECHANISM PAYLOAD BAY DOOR DRIVE GEARBOX 5) 6) 7) 8) 9) CRITICALITIES HDW/FUNC HDW/FUNC ABORT FLIGHT PHASE PRELAUNCH: RTLS: / TAL: LIFTOFF: 2/2 AOA: ONORBIT: 2/2 ATO: **DEORBIT:** 2/2 LANDING/SAFING: A[] B[] C[] REDUNDANCY SCREENS: STARBOARD/PORT PBD LOCATION: PART NUMBER: MC162-0008-0004 CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE, TEMPERATURE, VIBRATION EFFECTS/RATIONALE: INSUFFICIENT OUTPUT WOULD NOT FULLY ROTATE THE PBD. SINGLE MOTOR DRIVE TIME WOULD BE REACHED BEFORE FULL PBD TRAVEL COMPLETED. VISUAL CUES ARE AVAILABLE TO THE CREW TO MONITOR PBD MOVEMENT.

REFERENCES: V070-594125

POSSIBLE LOSS OF MISSION. NO EFFECT ON CREW/VEHICLE.

HIGHEST CRITICALITY HDW/FUNC DATE: 7/22/87 SUBSYSTEM: MECH/PBD FLIGHT: 1/1 ABORT: 1/1 MDAC ID: 5158 PAYLOAD BAY DOOR DRIVE TORQUE SHAFT/COUPLING ITEM: FAILURE MODE: BROKEN LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: MECHANICAL ACTUATION SYSTEM 1) PAYLOAD BAY DOORS SUBSYSTEM PAYLOAD BAY DOOR DRIVE MECHANISM 4) PAYLOAD BAY DOOR DRIVE TORQUE SHAFT/COUPLING 5) 6) 7) 8) 9) CRITICALITIES FLIGHT PHASE HDW/FUNC ABORT HDW/FUNC / RTLS: PRELAUNCH: / LIFTOFF: TAL: 1/1 ONORBIT: AOA: 1/1 DEORBIT: 1/1 ATO: LANDING/SAFING: c [] B [] REDUNDANCY SCREENS: A [] LOCATION: STARBOARD/PORT PBD PART NUMBER: MC162-0008-0009 TO -0031 CAUSES: MECHANICAL SHOCK, PIECE-PART FAILURE, VIBRATION EFFECTS/RATIONALE: BROKEN TORQUE SHAFT/COUPLING COULD CAUSE THE LOSS OF UP TO 4 PBD ROTARY ACTUATORS. LOSS OF MISSION WOULD OCCUR IF PBD COULD NOT BE OPENED. LOSS OF CREW/VEHICLE COULD HAPPEN IF PBD COULD NOT BE CLOSED. AN EVA PROCEDURE EXISTS FOR THE MANUAL CLOSURE OF PBD.

HIGHEST CRITICALITY HDW/FUNC 7/22/87 DATE: 2/1R FLIGHT: SUBSYSTEM: MECH/PBD 2/1R ABORT: MDAC ID: 5159 PAYLOAD BAY DOOR DRIVE SUPPORT BEARING ASSEMBLY ITEM: FAILURE MODE: SEIZED BEARING SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: J. BACHER BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) PAYLOAD BAY DOORS SUBSYSTEM 3) PAYLOAD BAY DOOR DRIVE MECHANISM 4) PAYLOAD BAY DOOR DRIVE SUPPORT BEARING ASSEMBLY

9)

	CRITICA	LITIES	
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	./	TAL:	. /
ONORBIT:	2/1R	AOA:	/
DEORBIT:	2/1R	ATO:	2/1R
LANDING/SAFING	G: /		

REDUNDANCY SCREENS: A [2] B [NA] C [F]

LOCATION: STARBOARD/PORT PBD PART NUMBER: MC162-0008-0008

CAUSES: CONTAMINATION, MECHANICAL SHOCK, OVERLOAD, PIECE-PART FAILURE, TEMPERATURE, VACUUM

EFFECTS/RATIONALE:

5) 6) 7) 8)

SEIZED BEARING WOULD HAVE NO EFFECT. EACH DOOR DRIVE SUPPORT BEARING ASSEMBLY HAS TWO DOUBLE SEALED/DUAL ROTATION BEARINGS. SINGLE BEARING WOULD CONTINUE TO TRANSMIT TORQUE BETWEEN TORQUE SHAFT SECTIONS. NO EFFECT ON CREW/VEHCLE FOR A SINGLE FAILURE.

HIGHEST CRITICALITY HDW/FUNC DATE: 7/22/87 1/1 MECH/PBD FLIGHT: SUBSYSTEM: 1/1 ABORT: MDAC ID: 5160 PAYLOAD BAY DOOR DRIVE SUPPORT BEARING ASSEMBLY ITEM: FAILURE MODE: PHYSICAL BINDING/JAMMING, BROKEN SUPPORT HOUSING LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM PAYLOAD BAY DOORS SUBSYSTEM 2) PAYLOAD BAY DOOR DRIVE MECHANISM PAYLOAD BAY DOOR DRIVE SUPPORT BEARING ASSEMBLY 5) 6) 7) 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE RTLS: PRELAUNCH: LIFTOFF: TAL: 1/1 ONORBIT: AOA: ATO: 1/1 DEORBIT: 1/1 LANDING/SAFING: REDUNDANCY SCREENS: A [] B [] LOCATION: STARBOARD/PORT PBD PART NUMBER: MC162-0008-0008 CAUSES: MECHANICAL SHOCK, OVERLOAD, PIECE-PART FAILURE EFFECTS/RATIONALE: THE SUPPORT HOUSING BREAKING FROM THE ORBITER FUSELAGE ATTACHMENT WOULD BIND OR BREAK TOROUE SHAFT. PBD MOVEMENT WOULD BE PREVENTED. LOSS OF MISSION WOULD OCCUR IF PBD COULD NOT BE OPENED FAR ENOUGH. LOSS OF CREW/VEHICLE COULD OCCUR IF PBD COULD TOM BE CLOSED. AN EVA PROCEDURE EXISTS FOR MANUAL CLOSING OF PBD.

HIGHEST CRITICALITY HDW/FUNC 7/22/87 DATE: 1/1 FLIGHT: MECH/PBD SUBSYSTEM: 1/1 ABORT: 5161 MDAC ID: PAYLOAD BAY DOOR DRIVE SUPPORT BEARING ASSEMBLY ITEM: FAILURE MODE: BROKEN SUPPORT SHAFT LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: MECHANICAL ACTUATION SYSTEM PAYLOAD BAY DOORS SUBSYSTEM 3) PAYLOAD BAY DOOR DRIVE MECHANISM PAYLOAD BAY DOOR DRIVE SUPPORT BEARING ASSEMBLY 4) 5) 6) 7) 8) 9) CRITICALITIES ABORT HDW/FUNC FLIGHT PHASE HDW/FUNC PRELAUNCH: / RTLS: TAL: LIFTOFF: 1/1 AOA: ONORBIT: 1/1 ATO: DEORBIT: 1/1 LANDING/SAFING: C [] REDUNDANCY SCREENS: A [] B [] STARBOARD/PORT PBD LOCATION: PART NUMBER: MC162-0008-0008 CAUSES: MECHANICAL SHOCK, OVERLOAD, PIECE-PART FAILURE EFFECTS/RATIONALE: BROKEN SUPPORT SHAFT COULD CAUSE THE LOSS OF 1 TO 4 ROTARY ACTUATORS. LOSS OF MISSION WOULD OCCUR IF PBD COULD NOT BE OPENED. LOSS OF CREW/VEHICLE COULD HAPPEN IF PBD COULD NOT BE CLOSED. AN EVA PROCEDURE EXISTS FOR THE MANUAL CLOSURE OF PBD.

HIGHEST CRITICALITY HDW/FUNC DATE: 7/22/87 SUBSYSTEM: MECH/PBD FLIGHT: 3/1R 3/1R ABORT: MDAC ID: 5162

ITEM:

PAYLOAD BAY DOOR DRIVE ROTARY ACTUATOR/TORQUE

LIMITER

FAILURE MODE: FAILS OUT OF TOLERANCE, TORQUE LIMITER SLIPS AT

LESS THAN MINIMUM LIMIT

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- PAYLOAD BAY DOORS SUBSYSTEM
- PAYLOAD BAY DOOR DRIVE MECHANISM 3)
- PAYLOAD BAY DOOR DRIVE ROTARY ACTUATOR/TORQUE LIMITER 4)

5) 6)

7)

8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	. /	RTLS:	/
LIFTOFF:		TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFI	NG: /		

REDUNDANCY SCREENS: A [2] B [NA] C [P]

LOCATION: STARBOARD/PORT PBD

PART NUMBER: MC162-0008-0005, MC162-0008-0033

CAUSES: CONTAMINATION, MECHANICAL SHOCK, MISHANDLING/ABUSE,

PIECE-PART FAILURE, TEMPERATURE, VIBRATION

EFFECTS/RATIONALE:

TORQUE LIMITER SLIPPING AT LESS THAN THE MINIMUM SPECIFIED LIMIT WOULD HAVE NO EFFECT. IF THERE IS NO OBSTACLE TO PBD MOVEMENT THE REMAINING 5 ROTARY ACTUATORS CAN OPEN/CLOSE THE PBD. IF THE DOOR LINKAGE ASSEMBLY WERE TO JAM THE OTHER TORQUE LIMITERS WOULD SLIP ALSO AND PBD MOVEMENT WOULD STOP. AN EVA CAPABILITY EXISTS TO MANUALLY CLOSE THE PBD.

DATE: 7/22/87 SUBSYSTEM: MECH/PBD MDAC ID: 5163	HIG	HEST CRITICALITY FLIGHT: ABORT:	HDW/FUNC 1/1 1/1
ITEM: PAYLOAD E LIMITER FAILURE MODE: FAILS OUT SLIP AT MAXIMUM ALLOWABI	OF TOLERANCE,		
LEAD ANALYST: J. BACHER	SUBSYS LE	AD: H.J. LOWERY	
BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION 2) PAYLOAD BAY DOOR SE 3) PAYLOAD BAY DOOR DE 4) PAYLOAD BAY DOOR DE 5) 6) 7) 8) 9)	SUBSYSTEM RIVE MECHANISM	ATOR/TORQUE LIMI	TER
	CRITICALITIE		
FLIGHT PHASE HI PRELAUNCH: LIFTOFF: ONORBIT: DEORBIT: LANDING/SAFING:	/ / 1/1 1/1	BORT HDW/FU RTLS: / TAL: / AOA: / ATO: 1/1	
REDUNDANCY SCREENS: A	[.] B [] c[]	
LOCATION: STARBOARD/ PART NUMBER: MC162-0008	PORT PBD	08-0033	
CAUSES: MECHANICAL SHOOTEMPERATURE, VIBRATION	CK, MISHANDLING/	ABUSE, PIECE-PAF	RT FAILURE,
EFFECTS/RATIONALE: POSSIBLE DAMAGE TO PBD A DOES NOT SLIP AT MAXIMUM POSSIBLY CAUSE THE LOSS	I TORQUE LIMIT.	DAMAGE TO PBD C	JE LIMITER COULD

DATE SUBS MDAC	YSTEM:	7/22/87 MECH/PBD 5164		HIGHES	T CRITICALITY FLIGHT: ABORT:	HDW/FUNC 1/1 1/1
	TER			OR DRIVE ROTA	RY ACTUATOR/TO	RQUE
				SUBSYS LEAD:		
11	MECHAN	IERARCHY: ICAL ACTUA D BAY DOOR D BAY DOOR D BAY DOOR	TON SVS	rem Echanism	R/TORQUE LIMIT	PER
			CR	TICALITIES		
	PRELI LIFT ONOR! DEOR!	PHASE AUNCH: OFF: BIT: BIT: ING/SAFING	HDW/FUNG / / 1/1 1/1	ABOR' R' T.	TLS: /	rc
REDU	NDANCY	SCREENS:	A []	B []	c []	
CAUS PIEC EFFE FAIL CAUS MISS	NUMBER ES: COI E-PART CTS/RAT URE OF E DAMAG	NTAMINATIO FAILURE, T IONALE: FORQUE LIM E TO THE P	008-0005, N, MECHAN EMPERATUR ITER TO R BD AND/OR BE OPENR	MC162-0008- NICAL SHOCK, I RE, VIBRATION RELEASE TORQUER DRIVE SYSTEMED OR LOSS OF	MISHANDLING/AB	JAM COULD

HIGHEST CRITICALITY HDW/FUNC DATE: 7/22/87 FLIGHT: 1/1 MECH/PBD SUBSYSTEM: 1/1 ABORT: 5165 MDAC ID: PAYLOAD BAY DOOR DRIVE ROTARY ACTUATOR/TORQUE ITEM: LIMITER FAILURE MODE: JAMMED ROTARY ACTUATOR GEARBOX SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: J. BACHER BREAKDOWN HIERARCHY: MECHANICAL ACTUATION SYSTEM 2) PAYLOAD BAY DOORS SUBSYSTEM 3) PAYLOAD BAY DOOR DRIVE MECHANISM 4) PAYLOAD BAY DOOR DRIVE ROTARY ACTUATOR/TORQUE LIMITER 5) 6) 7) 8) 9) CRITICALITIES ABORT HDW/FUNC FLIGHT PHASE HDW/FUNC RTLS: / PRELAUNCH: / TAL: LIFTOFF: 1/1 AOA: ONORBIT: 1/1 ATO: DEORBIT: 1/1 LANDING/SAFING:

REDUNDANCY SCREENS: A [] B [] C []

LOCATION: STARBOARD/PORT PBD

PART NUMBER: MC162-0008-0005, MC162-0008-0033

CAUSES: CONTAMINATION, MECHANICAL SHOCK, OVERLOAD, PIECE-PART

FAILURE, TEMPERATURE

EFFECTS/RATIONALE:

JAMMED ROTARY ACTUATOR GEARBOX WOULD PREVENT DOOR LINKAGE FROM MOVING. TORQUE LIMITERS WOULD SLIP DUE TO JAMMED LINKAGE. PBD OPEN/CLOSING STOPS. POSSIBLE LOSS OF CREW/VEHICLE AND MISSION. EVA CAPABILITY EXISTS TO MANUALLY CLOSE THE PBDS.

HIGHEST CRITICALITY HDW/FUNC DATE: 7/22/87 FLIGHT: 1/1 SUBSYSTEM: MECH/PBD ABORT: 1/1 5166 MDAC ID: PAYLOAD BAY DOOR DRIVE ROTARY ACTUATOR/TORQUE ITEM: LIMITER FAILURE MODE: ROTARY ACTUATOR OUTPUT ARM BROKEN LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM PAYLOAD BAY DOORS SUBSYSTEM 2) PAYLOAD BAY DOOR DRIVE MECHANISM 3) 4) PAYLOAD BAY DOOR DRIVE ROTARY ACTUATOR/TORQUE LIMITER 5) 6) 7) 8) 9) CRITICALITIES FLIGHT PHASE HDW/FUNC ABORT HDW/FUNC RTLS: PRELAUNCH: TAL: LIFTOFF: 1/1 AOA: ONORBIT: 1/1 1/1 ATO: DEORBIT: LANDING/SAFING: REDUNDANCY SCREENS: A [] B [] C [] LOCATION: STARBOARD/PORT PBD PART NUMBER: MC162-0008-0005, MC162-0008-0033 CAUSES: MECHANICAL SHOCK, PIECE-PART FAILURE EFFECTS/RATIONALE: BROKEN ROTARY ACTUATOR OUTPUT ARM WOULD LET LINKAGE PUSHROD FLOAT FREE. THE PUSHROD THEN COULD LODGE IN A POSITION WHICH WOULD JAM LINKAGE AND PREVENT PBD MOVEMENT. POSSIBLE LOSS OF CREW/VEHICLE AND MISSION. EVA COULD BE DONE TO CLEAR THE JAM.

HIGHEST CRITICALITY HDW/FUNC 7/22/87 DATE: 2/1R FLIGHT: SUBSYSTEM: MECH/PBD 2/1R ABORT: 5167 MDAC ID: PAYLOAD BAY DOOR DRIVE ROTARY ACTUATOR/TORQUE ITEM: LIMITER FAILURE MODE: BROKEN MOUNTING BRACKET SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: J. BACHER BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM PAYLOAD BAY DOORS SUBSYSTEM 2) PAYLOAD BAY DOOR DRIVE MECHANISM 3) PAYLOAD BAY DOOR DRIVE ROTARY ACTUATOR/TORQUE LIMITER 4) 5) 6) 7) 8) 9)

CRITICALITIES

	CTATION	and the second second	
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	,	RTLS:	/
LIFTOFF:	,	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	2/1R	ATO:	2/1R
LANDING/SAFING	; : /		

REDUNDANCY SCREENS: A [2] B [NA] C [P]

LOCATION: STARBOARD/PORT PBD

PART NUMBER: MC162-0008-0005, MC162-0008-0033

CAUSES: MECHANICAL SHOCK, PIECE-PART FAILURE

EFFECTS/RATIONALE:

BROKEN MOUNTING BRACKET WOULD LESSEN STRUCTURAL INTEGRITY OF ASSEMBLY. THE 3 REMAINING MOUNTING AREAS WILL TAKE UP THE LOAD. NO EFFECT ON CREW/VEHICLE OR MISSION. POSSIBLE JAMMING COULD OCCUR IF TWO OR MORE MOUNTING POINTS FAIL.

DATE: SUBSYSTEM: MDAC ID:			HIGHEST C	RITICALITY FLIGHT: ABORT:	HDW/FUNC 1/1 1/1
		BAY DOOR DRI'		ASSEMBLY	
LEAD ANALYS	r: J. BACHE	R SUBSY	S LEAD: H.	J. LOWERY	
1) MECHAN 2) PAYLOA 3) PAYLOA	6) 7) 8)				
		CRITICAL	ITIES		
LIFT ONOR DEOR	AUNCH: OFF: BIT:	HDW/FUNC / 1/1 1/1		· //	C
REDUNDANCY	SCREENS:	A []	В[]	c []	
LOCATION: PART NUMBER	STARBOAR : V070-594	RD/PORT ORBITE	R MIDFUSEL 0-594130-0	AGE 001, V070-59	9431-0001
CAUSES: CO	NTAMINATION	, MECHANICAL S	SHOCK, PIE	CE-PART FAI	LURE,
TO SLIP. DO OPEN PBD.	MING IN DOC OOR MOVEMEN LOSS OF CRE	OR DRIVE LINKAGE WOULD STOP. W/VEHICLE IF UNITED STOPE WATER TO THE PROPERTY OF THE PROPERTY O	LOSS OF JNABLE TO	MISSION IF U	JNABLE TO

DATE: 7/22/87 HIGHEST CRITICALITY HDW/FUNC SUBSYSTEM: MECH/PBD FLIGHT: 3/1R MDAC ID: 5169 ABORT: 3/1R

ITEM: PAYLOAD BAY DOOR DRIVE LINKAGE ASSEMBLY FAILURE MODE: BROKEN

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PAYLOAD BAY DOORS SUBSYSTEM
- 3) PAYLOAD BAY DOOR DRIVE MECHANISM
- 4) PAYLOAD BAY DOOR DRIVE LINKAGE ASSEMBLY

5)

6)

7)

8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	7	RTLS:	/
LIFTOFF:	./	TAL:	/
ONORBIT:	3/1R	AOA:	/
DEORBIT:	3/1R	ATO:	3/1R
LANDING/SAFI	NG: /		•

REDUNDANCY SCREENS: A [2] B [NA] C [P]

LOCATION: STARBOARD/PORT ORBITER MIDFUSELAGE

PART NUMBER: V070-594126-0001, V070-594130-0001, V070-59431-0001

CAUSES: MECHANICAL SHOCK, PIECE-PART FAILURE

EFFECTS/RATIONALE:

BROKEN PUSHROD OR BELLCRANK WOULD HAVE NO EFFECT ON MISSION OR CREW/VEHICLE. REMAINING 5 DOOR DRIVE LINKAGE ASSEMBLIES WILL OPEN/CLOSE PBD.

		7/22/87 MECH/PBD 5170			HIGHEST	F	TICALITY LIGHT: BORT:	HDW/FUNC 3/3 3/3
ITEN FAII	T -	PAYLOA E: FAILS	the state of the s		LIMIT	SWIT	СН	
LEAI	ANALYST	r: J. BACH	ER	SUBSYS	LEAD:	H.J.	LOWERY	
1) 2) 3)	MECHANI PAYLOAI PAYLOAI	ERARCHY: CAL ACTUA D BAY DOOR D BAY DOOR D BAY DOOR	S SUBSYS'	TEM ECHANIS	M TCH			
			CR.	ITICALI	TIES			
	PRELA LIFTO ONORE DEORE	BIT:	HDW/FUNG	С		LS: L: A:	HDW/FUN / / 3/3	·
REDU	INDANCY S	CREENS:	A []	В	[]		c []	
		FORWARD		ARY ACT	UATOR O	N STA	ARBOARD/P	ORT PBD
		TAMINATIO				IECE-	-PART FAI	LURE,
PBD DOOF WHEN MOTO	MOTOR WO R WOULD F I LINKAGE OR THE SI	ONALE: DULD CONTI REACH FULL ES WILL NO INGLE MOTO NO EFFECT	NUE TO RI OPEN POS LONGER I R DRIVE	UN. WI SITION, MOVE. FIME LI	TH TWO TORQUE IN THE MIT WOU	MOTOR LIMI EVENT LD BE	RS OPERAT TERS WOU FOF A FA HIT AND	LD SLIP ILED
REFERENCES: V070-594125								

HIGHEST CRITICALITY HDW/FUNC 7/22/87 DATE: FLIGHT: 3/2R SUBSYSTEM: MECH/PBD 3/2R ABORT: MDAC ID: 5171 PAYLOAD BAY DOOR OPEN LIMIT SWITCH ITEM: FAILURE MODE: PREMATURE OPERATION LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: MECHANICAL ACTUATION SYSTEM 1) PAYLOAD BAY DOORS SUBSYSTEM 2) PAYLOAD BAY DOOR DRIVE MECHANISM 3) PAYLOAD BAY DOOR OPEN LIMIT SWITCH 4) 5) 6) 7)

CRITICALITIES

CICTTTCI		
HDW/FUNC	ABORT	HDW/FUNC
/	RTLS:	
/	TAL:	/
3/2R	AOA:	/
1	ATO:	3/2R
: /		
	HDW/FUNC	/ RTLS: / TAL: 3/2R AOA: / ATO:

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: FORWARD/AFT ROTARY ACTUATOR ON STARBOARD/PORT PBD PART NUMBER: MC162-0008-0005

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE, VIBRATION, SHORTED

EFFECTS/RATIONALE:

8) 9)

OPEN LIMIT SWITCH PREMATURELY GOING TO THE OPEN POSITION WOULD SHUT OFF A MOTOR. REDUNDANT MOTOR WOULD CONTINUE OPENING OF PBD AT A REDUCED RATE. FAILURE IN BOTH SWITCHES WOULD CAUSE THE LOSS OF MISSION SINCE PBD COULD NOT BE OPENED. NO EFFECT ON CREW/VEHICLE.

DATI SUBS MDAG	E: SYSTEM: C ID:	7/22/87 MECH/PBD 5172		HIGHEST	CRITICALITY FLIGHT: ABORT:	HDW/FUNC 3/3 /
		PAYLOA E: FAILS	TO SWITCH	R 88 DEGREES		ender in the second of the second
LEA	D ANALYS'	r: J. BACH	ER :	SUBSYS LEAD:	H.J. LOWERY	
1) 2) 3)	MECHAN: PAYLOA! PAYLOA!	IERARCHY: ICAL ACTUA D BAY DOOR D BAY DOOR D BAY DOOR	S SUBSYST	EM EM CHANISM ES LIMIT SWIT	СН	
				TICALITIES		
	LIFT(ONOR) DEOR)	PHASE AUNCH: OFF: BIT: BIT: ING/SAFING	//	TA AO	HDW/FUN LS: / L: / A: /	rc
RED	UNDANCY S	SCREENS:	A []	В[]	c []	
PAR!	r number ses: coi	: MC162-0	008-0005 N, MECHAN	ICAL SHOCK, P	N STARBOARD/F	
NO I	ICATOR W	N CREW/VEH HICH IS US	ED ONLY WI	HEN THE ORBIT	SWITCH IS A ER IS ON THE IKE SERVICE S	PAD. PBD

DATE: 7/22/87 SUBSYSTEM: MECH/PBD MDAC ID: 5173	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: /					
ITEM: PAYLOAD BAY DOOR 88 FAILURE MODE: PREMATURE OPERATION	DEGREES LIMIT SWITCH					
LEAD ANALYST: J. BACHER SUBSY	S LEAD: H.J. LOWERY					
BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) PAYLOAD BAY DOORS SUBSYSTEM 3) PAYLOAD BAY DOOR DRIVE MECHANISM 4) PAYLOAD BAY DOOR 88 DEGREES LIMIT SWITCH 5) 6) 7) 8) 9)						
CRITICA	LITIES					
FLIGHT PHASE HDW/FUNC	ABORT HDW/FUNC					
PRELAUNCH: 3/3	RTLS: /					
LIFTOFF: /	TAL: / . AOA: /					
ONORBIT: /	AOA:					
DEORBIT: /	ATO:					
LANDING/SAFING: /						
REDUNDANCY SCREENS: A []	B [] C []					
LOCATION: FORWARD/AFT ROTARY ACTUATOR ON STARBOARD/PORT PBD PART NUMBER: MC162-0008-0005						
CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE, VIBRATION, SHORTED						
EFFECTS/RATIONALE: NO EFFECT ON CREW/VEHICLE OR MISSION. THIS SWITCH IS A GSE INDICATOR WHICH IS USED ONLY WHEN THE ORBITER IS ON THE PAD. PBD COULD STILL BE OPENED MANUALLY USING VISUAL CUES.						

HIGHEST CRITICALITY HDW/FUNC DATE: 7/22/87 SUBSYSTEM: MECH/PBD FLIGHT: 1/1 ABORT: MDAC ID: 5174 1/1 PAYLOAD BAY DOOR ITEM: FAILURE MODE: WARPED LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM PAYLOAD BAY DOORS SUBSYSTEM 2) PAYLOAD BAY DOOR 3) 4) 5) 6) 7) 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE RTLS: PRELAUNCH: / TAL: LIFTOFF: 1/1 AOA: ATO: ONORBIT: 1/1 DEORBIT: 1/1 LANDING/SAFING: / REDUNDANCY SCREENS: A [] B [] C [] LOCATION: ORBITER MIDFUSELAGE, PORT AND STARBOARD SIDES PART NUMBER: CAUSES: MECHANICAL SHOCK, PIECE-PART FAILURE, TEMPERATURE, MISRIGGED EFFECTS/RATIONALE: WARPED PBD COULD NOT BE LATCHED CLOSED DUE TO MISALIGNMENT BETWEEN LATCHES AND ROLLERS. WARPAGE DUE TO THERMAL GRADIENT CAN BE CORRECTED BY VARYING ORBITER ATTITUDE. IF WARPAGE CANNOT BE REDUCED OR ELIMINATED THEN LOSS OF CREW/VEHICLE IS POSSIBLE. VEHICLE WOULD HAVE REDUCED STRUCTURAL INTEGRITY IF PBDS CANNOT BE CLOSED. REFERENCES: V070-594125

DATE: 7/22/87 SUBSYSTEM: MECH/PBD MDAC ID: 5175	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 1/1 ABORT: 1/1					
ITEM: PAYLOAD BAY DOOR FAILURE MODE: DAMAGED PANEL						
LEAD ANALYST: J. BACHER SUBSY	S LEAD: H.J. LOWERY					
BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) PAYLOAD BAY DOORS SUBSYSTEM 3) PAYLOAD BAY DOOR 4) 5) 6) 7) 8)						
CRITÍCAL	TTIES					
FLIGHT PHASE HDW/FUNC PRELAUNCH: / LIFTOFF: / ONORBIT: 1/1 DEORBIT: 1/1 LANDING/SAFING: /						
REDUNDANCY SCREENS: A []	в[] с[]					
LOCATION: ORBITER MIDFUSELAGE, PORT AND STARBOARD SIDES PART NUMBER:						
CAUSES: MECHANICAL SHOCK, OVERLOAD, PIECE-PART FAILURE						
EFFECTS/RATIONALE: DAMAGED PANEL WOULD REDUCE STRUCTURAL INTEGRITY OF THE VEHICLE. POSSIBLE LOSS OF CREW/VEHICLE IF DAMAGE AREA IS LARGE OR AREA WERE TO INCREASE TO AN EXTENT THAT ENTIRE DOOR WOULD FAIL.						

HIGHEST CRITICALITY HDW/FUNC DATE: 7/22/87 2/1R SUBSYSTEM: MECH/PBD FLIGHT: ABORT: 2/1RMDAC ID: 5176 PAYLOAD BAY DOOR ALIGNMENT ROLLER ITEM: FAILURE MODE: PHYSICAL BINDING/JAMMING SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: J. BACHER BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM PAYLOAD BAY DOORS SUBSYSTEM PAYLOAD BAY DOOR ALIGNMENT ROLLER 4) 5) 6) 7) 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE PRELAUNCH: RTLS: TAL: LIFTOFF: 2/1R ONORBIT: AOA: 2/1R 2/1R ATO: DEORBIT:

REDUNDANCY SCREENS: A [2] B [NA] C [P]

LOCATION: AFT STARBOARD/PORT PBD

LANDING/SAFING:

PART NUMBER:

CAUSES: MECHANICAL SHOCK, PIECE-PART FAILURE, TEMPERATURE, MISADJUSTED

EFFECTS/RATIONALE:

JAMMED ROLLER COULD PREVENT AFT BULKHEAD LATCH GANG FROM BEING ENGAGED. RESULTS IN SOME LOSS OF STRUCTURAL INTEGRITY. SAFE ENTRY POSSIBLE WITH ONE BULKHEAD LATCH GANG NOT ENGAGED. NO EFFECT ON CREW/VEHICLE.

HIGHEST CRITICALITY 7/22/87 HDW/FUNC DATE: FLIGHT: 3/1R SUBSYSTEM: MECH/PBD 3/1R ABORT: MDAC ID: 5177 PAYLOAD BAY DOOR ALIGNMENT ROLLER GUIDE ITEM: FAILURE MODE: BROKEN LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM PAYLOAD BAY DOORS SUBSYSTEM 2) PAYLOAD BAY DOOR ALIGNMENT ROLLER GUIDE 3) 4) 5) 6) 7) 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE PRELAUNCH: RTLS: / TAL: LIFTOFF: 3/1R AOA: ONORBIT: 3/1R 3/1R ATO: DEORBIT: LANDING/SAFING: / B [NA] C [P] REDUNDANCY SCREENS: A [2] AFT STARBOARD/PORT PAYLOAD BAY BULKHEAD LOCATION: PART NUMBER: CAUSES: MECHANICAL SHOCK, PIECE-PART FAILURE EFFECTS/RATIONALE: BROKEN ROLLER GUIDE WOULD INCREASE STRUCTURAL LOAD ON THE REMAINING 3 ROLLER GUIDES. NO EFFECT ON CREW/VEHICLE OR MISSION.

SUBSYSTE	7/22/87 M: MECH/PBD 5178	•		TICALITY FLIGHT: ABORT:	3/3
	PAYLOA MODE: FAILS		PASSIVE STOP RANCE, BROKEN		
LEAD ANA	LYST: J. BACH	ER SUE	SYS LEAD: H.J.	LOWERY	
1) MEC	N HIERARCHY: HANICAL ACTUA LOAD BAY DOOF LOAD BAY DOOF	TION SYSTEM	pp '		· · · · ·
		CRITIC	CALITIES		-
FLIGI PI LI OI DI	HT PHASE RELAUNCH: IFTOFF: NORBIT: EORBIT: ANDING/SAFING	HDW/FUNC / 3/3 3/3.		HDW/FUN / / 3/3	С
REDUNDAN	CY SCREENS:	A []	в []	c []	
PART NUMI CAUSES: EFFECTS/I NO EFFECT PASSIVE S	PIECE-PART F RATIONALE: I ON CREW/VEH STOP. IF ALL	4117-001, VO AILURE, MISA ICLE OR MISS 4 WERE TO F	70-594117-002	TRAVEL B	SADJUSTED Y LEFT

HIGHEST CRITICALITY HDW/FUNC 7/22/87 DATE: 3/1R FLIGHT: MECH/PBD SUBSYSTEM: 3/1R ABORT: MDAC ID: 5179 PAYLOAD BAY DOOR SHEAR/FLOATING HINGE ITEM: FAILURE MODE: PHYSICAL BINDING/JAMMING LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: MECHANICAL ACTUATION SYSTEM PAYLOAD BAY DOORS SUBSYSTEM 2) 3) PAYLOAD BAY DOOR SHEAR/FLOATING HINGE 4) 5) 6) 7) 8) 9)

CRITICALITIES

HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE RTLS: PRELAUNCH: / TAL: LIFTOFF: 3/1R AOA: ONORBIT: 3/1R ATO: DEORBIT: 3/1R LANDING/SAFING:

REDUNDANCY SCREENS: A [2] B [NA] C [P]

LOCATION: STARBOARD/PORT ORBITER MIDFUSELAGE PART NUMBER:

CAUSES: PIECE-PART FAILURE, TEMPERATURE

EFFECTS/RATIONALE:

BINDING/JAMMING HINGE WOULD CAUSE A LOSS OF REDUNDANCY (13 TOTAL, 5 SHEAR HINGES, 8 FLOATING HINGES). NO EFFECT ON CREW/VEHICLE OR MISSION.

DATE:

8/25/87

HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: MECH/PBD/EPD&C MDAC ID:

5501

FLIGHT: 2/1R ABORT:

2/1R

ITEM:

CONTROL BUS 1.2K RESISTOR

FAILURE MODE: SHORTS, RESISTANCE LOWER THAN RATED VALUE

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- PAYLOAD BAY DOORS EPD&C 2)
- DC CONTROL BUS 3)
- 1.2K RESISTOR 4)

5)

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:		TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	2/1R	ATO:	2/1R
LANDING/SAFIN	G: /		

REDUNDANCY SCREENS: A [2] B [F] C [P]

AFT ORBITER FLIGHT DECK, PANEL R13L

PART NUMBER: A1R1, A1R2, A1R3

CAUSES: THERMAL STRESS, VIBRATION, MECHANICAL SHOCK, PIECE-PART

FAILURE

EFFECTS/RATIONALE:

RESISTOR THAT SHORTS OR WITH RESISTANCE LOWER THAN RATED VALUE WOULD ALLOW EXCESSIVE CURRENT TO REACH OTHER COMPONENTS. HIGHER CURRENT CAUSES LOSS OF COMPONENT AND LOSS OF FUNCTION. REDUNDANT ELEMENTS WILL CONTINUE OPERATION BUT AT A REDUCED RATE. NO EFFECT ON CREW/VEHICLE OR MISSION.

DATE: 8/25/87 HIGHEST CRITICALITY HDW/FUNC SUBSYSTEM: MECH/PBD/EPD&C FLIGHT: 2/1R

MDAC ID: 5502 ABORT: 2/1R

ITEM: CONTROL BUS 1.2K RESISTOR

FAILURE MODE: OPEN CIRCUIT

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PAYLOAD BAY DOORS EPD&C
- 3) DC CONTROL BUS
- 4) 1.2K RESISTOR

5)

6)

7)

8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	,	RTLS:	/	
LIFTOFF:	,	TAL:	/	
ONORBIT:	2/1R	AOA:	/	
DEORBIT:	2/1R	ATO:	2/1R	
LANDING/SAFI	1G: /			

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: AFT ORBITER FLIGHT DECK, PANEL R13L

PART NUMBER: A1R1, A1R2, A1R3

CAUSES: THERMAL STRESS, VIBRATION, MECHANICAL SHOCK, PIECE-PART FAILURE

EFFECTS/RATIONALE:

RESISTOR FAILURE AS AN OPEN CIRCUIT WOULD CAUSE A LOSS OF CURRENT TO OTHER COMPONENTS. THIS RESULTS IN A LOSS OF REDUNDANCY WHEN AFFECTED COMPONENTS CANNOT OPERATE. REDUNDANT ELEMENTS WILL CONTINUE OPERATION BUT AT A REDUCED RATE. NO EFFECT ON CREW/VEHICLE OR MISSION.

8/25/87 HIGHEST CRITICALITY HDW/FUNC DATE: SUBSYSTEM: MECH/PBD/EPD&C FLIGHT: 2/1R

2/1R ABORT: MDAC ID: 5503

CONTROL BUS 1.2K RESISTOR ITEM:

FAILURE MODE: RESISTANCE HIGHER THAN RATED VALUE

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PAYLOAD BAY DOORS EPD&C
- 3) DC CONTROL BUS
- 1.2K RESISTOR 4)

5)

6)

7)

8) 9)

CRITICALITIES

HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE RTLS: TAL: AOA: ATO: / / 2/1R PRELAUNCH: / 7 ---LIFTOFF: ONORBIT: DEORBIT: 2/1R 2/1R LANDING/SAFING: /

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: AFT ORBITER FLIGHT DECK, PANEL R13L

PART NUMBER: A1R1, A1R2, A1R3

CAUSES: THERMAL STRESS, VIBRATION, MECHANICAL SHOCK, PIECE-PART

FAILURE

EFFECTS/RATIONALE:

RESISTANCE HIGHER THAN RATED VALUE WOULD REDUCE CURRENT TO THE RELAY WHICH CLOSES TO PASS AC BUS POWER TO THE ACTUATOR MOTORS. LOGIC CIRCUIT INPUT WOULD BE LOW SIGNIFYING RELAY NEED NOT BE CLOSED. REDUNDANT MCA WOULD ALLOW AC POWER TO REACH ACTUATOR MOTORS. NO EFFECT ON CREW/VEHICLE OR MISSION.

REFERENCES: VS72-956099, RELAY CONTROL AC POWER IN MCA

DATE: 8/25/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: MECH/PBD/EPD&C FLIGHT: 2/1R MDAC ID: 5504 ABORT: 2/1R

ITEM: PAYLOAD BAY DOORS CONTROL SWITCH

FAILURE MODE: FAILS TO SWITCH

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PAYLOAD BAY DOORS EPD&C
- 3) DC CONTROL BUS
- 4) PAYLOAD BAY DOORS OPEN-CLOSE SWITCH

5)

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:		RTLS:	/
LIFTOFF:	,	TAL:	/
ONORBIT:	2/1R .	AOA:	/
DEORBIT:	2/1R	ATO:	2/1R
LANDING/SAFI	NG: /		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: AFT ORBITER FLIGHT DECK, PANEL R13L

PART NUMBER: S3

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE, VIBRATION

EFFECTS/RATIONALE:

FAILURE OF PAYLOAD BAY DOORS CONTROL SWITCH TO SWITCH TO THE DESIRED COMMAND (OPEN-STOP-CLOSE) CAUSES A LOSS OF REDUNDANCY. PBDS CAN BE COMMANDED IN THE DESIRED DIRECTION BY USING THE DEU ON PANEL R12. THE "PBD SW BYPASS" ENTRY WILL ALLOW SOFTWARE CONTROL OF THE SWITCH FUNCTIONS. NO EFFECT ON CREW/VEHICLE OR MISSION.

HIGHEST CRITICALITY HDW/FUNC 8/25/87 DATE: SUBSYSTEM: MECH/PBD/EPD&C FLIGHT: 2/1R ABORT: 2/1R

5505 MDAC ID:

ITEM: FUSE, 1A

FAILURE MODE: OPEN (ELECTRICAL), FAILS OUT OF TOLERANCE

SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: J. BACHER

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PAYLOAD BAY DOORS EPD&C
- 3) DC CONTROL BUS
- FUSE, 1A 4)
- 5)
- 6)
- 7) 8)
- 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	7	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	2/1R	ATO:	2/1R
LANDING/SAFING:	/		

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: AFT ORBITER FLIGHT DECK, PANEL R13A2

PART NUMBER: F37-F42

VIBRATION, MECHANICAL SHOCK, OVERLOAD, PIECE-PART CAUSES:

FAILURE

EFFECTS/RATIONALE:

FAILED FUSE CAUSES A LOSS OF REDUNDANCY. FAILURE CAUSES LOSS OF DC POWER TO RELAYS WHICH ARE CLOSED TO SUPPLY AC POWER TO ACTUATOR MOTORS. REDUNDANT ELEMENTS WILL COMPLETE ACTUATOR OPERATION BUT AT A REDUCED RATE. NO EFFECT ON CREW/VEHICLE OR MISSION.

HIGHEST CRITICALITY HDW/FUNC DATE: 8/25/87 2/1R SUBSYSTEM: MECH/PBD/EPD&C FLIGHT: 2/1R ABORT:

MDAC ID: 5506

PAYLOAD BAY DOOR MECHANICAL POWER SWITCH

FAILURE MODE: FAILS TO SWITCH

SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: J. BACHER

BREAKDOWN HIERARCHY:

- MECHANICAL ACTUATION SYSTEM
- PAYLOAD BAY DOORS EPD&C 2)
- 3) DC CONTROL BUS
- PAYLOAD BAY DOOR MECHANICAL POWER SWITCH 4)

5)

ITEM:

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	,	RTLS:	/
LIFTOFF:	,	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	2/1R	ATO:	2/1R
LANDING/SAFIN	1G: /		

REDUNDANCY SCREENS: A [2] B [P] C [P]

AFT ORBITER FLIGHT DECK, PANEL R13A2 LOCATION:

PART NUMBER: S13 (SYS 1), S14 (SYS 2)

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE, VIBRATION

EFFECTS/RATIONALE:

FAILURE OF PBD MECHANICAL POWER SWITCH TO GO TO THE COMMANDED POSITION CAUSES A LOSS OF REDUNDANCY. POWER COULD STILL BE APPLIED TO THE ACTUATOR MOTOR RELAYS AND MCA LOGIC RELAYS BY USING THE DEU ON PANEL R12. NO EFFECT ON CREW/VEHICLE OR MISSION.

HIGHEST CRITICALITY HDW/FUNC 8/25/87 DATE: SUBSYSTEM: MECH/PBD/EPD&C FLIGHT: 2/1R

ABORT: 2/1R MDAC ID: 5507

MAIN DC BUS RELAY ITEM: FAILURE MODE: FAILS TO CLOSE

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- PAYLOAD BAY DOORS EPD&C
- 3) MID MOTOR CONTROL ASSEMBLY
- 4) MAIN DC BUS RELAY
- 5)
- 6)
- 7)
- 8) 9)

CRITICALITIES

HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE RTLS: TAL: AOA: / PRELAUNCH: LIFTOFF: 2/1R ONORBIT: DEORBIT: ATO: 2/1R 2/1R LANDING/SAFING: /

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: ORBITER MID FUSELAGE, MID MCA-1, -2, -3, -4 PART NUMBER: K78, K66, K37, K39, K54, K42, K22, K20, K29, K41

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE, VIBRATION

EFFECTS/RATIONALE:

RELAY IS USED TO SUPPLY AC BUS POWER TO PAYLOAD BAY DOOR DRIVE MOTORS, CENTERLINE AND BULKHEAD LATCH ACTUATOR MOTORS. FAILURE OF RELAY CAUSES AN OPEN CIRCUIT AND THE LOSS OF A MOTOR. THE REDUNDANT MOTOR CONTINUES THE PARTICULAR FUNCTION BUT AT A REDUCED RATE. NO EFFECT ON CREW/VEHICLE OR MISSION.

DATE: SUBSYSTEM: M MDAC ID: 5	8/25/87 ECH/PBD/EP 508	D&C	HIGHEST C	RITICALITY FLIGHT: ABORT:	HDW/FUNC 3/3 3/3
ITEM: FAILURE MODE:					
LEAD ANALYST:	J. BACHER	SUBSY	s LEAD: H.	J. LOWERY	
BREAKDOWN HIE 1) MECHANIC 2) PAYLOAD 3) MID MOTO 4) MAIN DC 5) 6) 7) 8)	AL ACTUATION DAY DOORS IN CONTROL	EPD&C			
		CRITICAL	TTTES		
FLIGHT PH	ASE H	DW/FUNC		HDW/FUN	С
PRELAU	NCH:	/,	RTLS	!	
LIFTOF		/	TAL:	. /	
ONORBI		3/3	AOA:	· /	
DEORBI	T: .	3/3	ATO:	3/3	•
	G/SAFING:			,	
REDUNDANCY SO	REENS: A	[]	в []	C []	
LOCATION: PART NUMBER:					
CAUSES: CONT	'AMINATION,	MECHANICAL	SHOCK, PIE	CE-PART FAI	LURE,
EFFECTS/RATIO FAILURE OF RE MISSION. AC PAIR OPENS OF	LAY TO OPE MOTOR POWE	R WILL BE RE	ECT ON CRE	W/VEHICLE O	R AY IN THE

HIGHEST CRITICALITY HDW/FUNC 8/25/87 DATE: SUBSYSTEM: MECH/PBD/EPD&C FLIGHT: 3/3 ABORT: 3/3 MDAC ID: 5509 ITEM: DIODE FAILURE MODE: OPEN CIRCUIT LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM PAYLOAD BAY DOORS EPD&C 3) MID MOTOR CONTROL ASSEMBLY 4) DIODE 5) 6) 7) 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE RTLS: TAL: / PRELAUNCH: / LIFTOFF: 3/3 AOA: ONORBIT: 3/3 ATO: 3/3 DEORBIT: LANDING/SAFING: / REDUNDANCY SCREENS: A[] B[] C[AFT ORBITER FLIGHT DECK, PANEL R13A2 LOCATION: PART NUMBER: A3CR1, A3CR2, A3CR3, A3CR4 CAUSES: THERMAL STRESS, VIBRATION, CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE EFFECTS/RATIONALE: OPEN CIRCUIT FAILURE MODE CAUSES A LOSS OF INPUT TO PAYLOAD BAY TALKBACK. PAYLOAD BAY DOORS STATUS IS DISPLAYED ON CRT SO FAILURE HAS NO EFFECT ON CREW/VEHICLE OR MISSION. REFERENCES: VS72-956099

HIGHEST CRITICALITY HDW/FUNC 8/25/87 DATE: 3/3 SUBSYSTEM: MECH/PBD/EPD&C FLIGHT: ABORT: 3/3 5510 MDAC ID: DIODE ITEM: FAILURE MODE: SHORTED OUT SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: J. BACHER BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) PAYLOAD BAY DOORS EPD&C 3) MID MOTOR CONTROL ASSEMBLY 4) DIODE 5) 6) 7) 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE RTLS: PRELAUNCH: / TAL: LIFTOFF: 3/3 AOA: ONORBIT: 3/3 ATO: DEORBIT: 3/3 LANDING/SAFING: REDUNDANCY SCREENS: A [] B [] C [] AFT ORBITER FLIGHT DECK, PANEL R13A2 LOCATION: PART NUMBER: A3CR1, A3CR2, A3CR3, A3CR4 CAUSES: THERMAL STRESS, VIBRATION, CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE EFFECTS/RATIONALE: DIODE PREVENTS SIGNAL FROM ONE MDM FEEDING BACK INTO THE OTHER. SHORTED DIODE WOULD ALLOW FEEDBACK INTO MDM. FEEDBACK WOULD HAVE NO EFFECT. TALKBACK AND VISUAL CUES WOULD SHOW PBD POSITION. NO

REFERENCES: VS72-956099

EFFECT ON CREW/VEHICLE OR MISSION.

DATE: 8/25/87 HIGHEST CRITICALITY HDW/FUNC SUBSYSTEM: MECH/PBD/EPD&C FLIGHT: 2/1R

MDAC ID: 5511 ABORT: 2/1R

ITEM: SWITCH RESISTOR, 1.2K 2W

FAILURE MODE: SHORTS, RESISTANCE LOWER THAN RATED VALUE

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PAYLOAD BAY DOORS EPD&C
- 3) MID MOTOR CONTROL ASSEMBLY
- 4) SWITCH RESISTOR, 1.2K 2W
- 5)
- 6)
- 7)
- 8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	2/1R	ATO:	2/1R
LANDING/SAFIN	iG: /		•

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: MID FUSELAGE MOTOR CONTROL ASSEMBLIES -1, -2, -3, -

PART NUMBER: SEE PAGES 56AB, AC, AD, AH, AJ IN REFERENCE

CAUSES: THERMAL STRESS, VIBRATION, CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE

EFFECTS/RATIONALE:

RESISTOR THAT SHORTS OR WITH RESISTANCE LOWER THAN RATED VALUE WOULD ALLOW EXCESSIVE CURRENT TO REACH RELAY AC MOTOR POWER LOGIC GATE. HIGHTER CURRENT CAUSES LOSS OF COMPONENET. POSSIBLE PREMATURE AC MOTOR POWER SHUT OFF. REDUNDANT MOTOR WOULD COMPLETE FUNCTION BUT AT A REDUCED RATE.

HIGHEST CRITICALITY HDW/FUNC 8/25/87 DATE: FLIGHT: 3/3 SUBSYSTEM: MECH/PBD/EPD&C ABORT: 3/3 5512 MDAC ID: SWITCH RESISTOR, 1.2K 2W ITEM: FAILURE MODE: OPEN CIRCUIT LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) PAYLOAD BAY DOORS EPD&C 3) MID MOTOR CONTROL ASSEMBLY SWITCH RESISTOR, 1.2K 2W 4) 5) 6) 7) 8) 9) CRITICALITIES HDW/FUNC ABORT FLIGHT PHASE HDW/FUNC / PRELAUNCH: RTLS: / TAL: LIFTOFF: 3/3 AOA: ONORBIT: · 3/3 ATO: 3/3 DEORBIT: LANDING/SAFING: C [] ВГ 1 REDUNDANCY SCREENS: A [] LOCATION: MID FUSELAGE MOTOR CONTROL ASSEMBLIES -1, -2, -3, -PART NUMBER: SEE PAGES 56AB, AC, AD, AH, AJ IN REFERENCE CAUSES: THERMAL STRESS, VIBRATION, CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE EFFECTS/RATIONALE: RESITOR FAILURE AS AN OPEN CIRCUIT CAUSES MOTOR TO CONTINUE TO RUN. RELAY WOULD NOT GET INPUT SIGNIFYING DOOR OR LATCHES WERE IN DESIRED POSITION. MOTOR WOULD STALL WHEN LIMIT REACHED. CREW

REFERENCES: VS72-956099

MISSION.

CAN REMOVE AC MOTOR POWER. NO EFFECT ON CREW/VEHICLE OR

HIGHEST CRITICALITY HDW/FUNC 8/25/87 DATE: SUBSYSTEM: MECH/PBD/EPD&C FLIGHT: 2/1R ABORT: 2/1R

MDAC ID:

ITEM:

5513

SWITCH RESISTOR, 1.2K 2W

FAILURE MODE: RESISTANCE HIGHER THAN RATED VALUE

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- PAYLOAD BAY DOORS EPD&C 2)
- 3) MID MOTOR CONTROL ASSEMBLY
- 4) SWITCH RESISTOR, 1.2K 2W

5) 6)

7)

8)

9)

CRITICALITIES

HDW/FUNC ABORT FLIGHT PHASE HDW/FUNC / RTLS: PRELAUNCH: / / LIFTOFF: TAL: ONORBIT: 2/1R AOA: 2/1R ATO: 2/1R DEORBIT: LANDING/SAFING: /

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION:

MID FUSELAGE MOTOR CONTROL ASSEMBLIES -1, -2, -3, -

PART NUMBER: SEE PAGES 56AB, AC, AD, AH, AJ IN REFERENCE

CAUSES: THERMAL STRESS, VIBRATION, CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE

EFFECTS/RATIONALE:

RESISTANCE HIGHER THAN RATED VALUE WOULD REDUCE CURRENT TO THE RELAY CONTROLLING AC POWER TO THE ACTUATOR MOTOR. LOGIC CIRCUIT INPUT WOULD BE LOW SIGNIFYING DOOR OR LATCHES WERE IN THE DESIRED POSITION. RELAY WOULD OPEN AND AC POWER WOULD BE REMOVED FROM ACTUATOR MOTOR. REDUNDANT ELEMENTS WOULD CONTINUE FUNCTION BUT AT A REDUCED RATE. NO EFFECT ON CREW/VEHICLE OR MISSION.

DATE: 8/25/87 HIGHEST CRITICALITY HDW/FUNC SUBSYSTEM: MECH/PBD/EPD&C FLIGHT: 2/1R MDAC ID: 5514 ABORT: 2/1R

ITEM: PAYLOAD BAY DOORS AC BUS RELAY

FAILURE MODE: FAILS TO CLOSE

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PAYLOAD BAY DOORS EPD&C
- 3) MID MOTOR CONTROL ASSEMBLY
- 4) PAYLOAD BAY DOORS AC BUS RELAY

5)

6)

7)

8) 9)

CRITICALITIES

	O1/1 1 1 Q1/		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	/
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	2/1R	ATO:	2/1R
LANDING/SAFII	NG: /		

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: MID FUSELAGE MOTOR CONTROL ASSEMBLIES -1, -2, -3, -

4

PART NUMBER: SEE PAGES 56AB, AC, AD, AH, AJ IN REFERENCE

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE, VIBRATION

EFFECTS/RATIONALE:

RELAY IS USED TO CONNECT THE 3 PHASE AC POWER TO THE ACTUATOR MOTORS FOR OPENING/CLOSING PAYLOAD BAY DOORS OR OPERATING THE LATCHES. FAILURE OF RELAY CAUSES AN OPEN CIRCUIT AND THE LOSS OF A MOTOR. THE REDUNDANT MOTOR CONTINUES THE PARTICULAR FUNCTION BUT AT A REDUCED RATE. NO EFFECT ON CREW/VEHICLE OR MISSION.

DATE: 8/25/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: MECH/PBD/EPD&C FLIGHT: 2/1R MDAC ID: 5515 ABORT: 2/1R

ITEM: PAYLOAD BAY DOORS AC BUS RELAY

FAILURE MODE: FAILS TO OPEN

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PAYLOAD BAY DOORS EPD&C
- 3) MID MOTOR CONTROL ASSEMBLY
- 4) PAYLOAD BAY DOORS AC BUS RELAY

5)

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	./	RTLS:	/
LIFTOFF:	<i>'</i> /	TAL:	,
ONORBIT:	2/1R	AOA:	,
DEORBIT:	3/3	ATO:	2/1R
LANDING/SAFIN	1G: /		·

REDUNDANCY SCREENS: A [2] B [F] C [P]

LOCATION: MID FUSELAGE MOTOR CONTROL ASSEMBLIES -1, -2, -3, -

PART NUMBER: SEE PAGES 56AB, AC, AD, AH, AJ IN REFERENCE

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE, VIBRATION

EFFECTS/RATIONALE:

FAILURE OF RELAY TO OPEN CAUSES THE LOSS OF AN ACTUATOR MOTOR. RELAY IS USED TO CHANNEL THE THREE PHASE AC BUS POWER TO THE ACTUATOR MOTOR (A-B-C OR A-C-B). IF RELAY USED IN RELEASING LATCHES AND OPENING PBD FAILS TO OPEN THEN WHEN PBD CLOSURE IS BEGUN THE B AND C PHASE REVERSAL WILL NOT OCCUR. REDUNDANT MOTOR WILL COMPLETE FUNCTION. NO EFFECT ON CREW/VEHICLE OR MISSION.

DATE: 8/25/87 HIGHEST CRITICALITY HDW/FUNC SUBSYSTEM: MECH/PBD/EPD&C FLIGHT: 2/1R MDAC ID: 5516 ABORT: 2/1R

ITEM: MCA AC POWER CIRCUIT BREAKER

FAILURE MODE: OPEN (ELECTRICAL), FAILS OUT OF TOLERANCE

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PAYLOAD BAY DOORS EPD&C
- 3) DISPLAY AND CONTROL
- 4) AC 3 PHASE BUS
- 5) MCA AC POWER CIRCUIT BREAKER

6) 7)

7) 8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/	RTLS:	
LIFTOFF:	/	TAL:	/
ONORBIT:	2/1R	AOA:	/
DEORBIT:	2/1R	ATO:	2/1R
LANDING/SAFI	NG: /		·

REDUNDANCY SCREENS: A [2] B [NA] C [P]

LOCATION: PANEL MA73C

PART NUMBER: CB12, CB7, CB9, CB13, CB2, CB3

CAUSES: OVERLOAD, PIECE-PART FAILURE, INADVERTENT OPERATION

EFFECTS/RATIONALE:

FAILURE OF CIRCUIT BREAKER CAUSES LOSS OF THE THREE PHASE AC POWER FROM THE MAIN AC BUS. REDUNDANT MOTOR WILL COMPLETE FUNCTION BUT AT A REDUCED RATE. NO EFFECT ON CREW/VEHICLE OR MISSION.

DATE: 8/25/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: MECH/PBD/EPD&C FLIGHT: 2/1R MDAC ID: 5517 ABORT: 2/1R

ITEM: MCA RELAY LOGIC POWER SWITCH

FAILURE MODE: FAILS OFF

LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PAYLOAD BAY DOORS EPD&C
- 3) DISPLAY AND CONTROL
- 4) CONTROL BUS
- 5) MCA RELAY LOGIC POWER SWITCH

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE HDW/FUNC ABORT HDW/FUNC 1 RTLS: PRELAUNCH: / TAL: LIFTOFF: 2/1R AOA: ONORBIT: 2/1R ATO: 2/1R DEORBIT: LANDING/SAFING:

LANDING/SAFING. /

REDUNDANCY SCREENS: A [2] B [P] C [P]

LOCATION: PANEL MA73C

PART NUMBER: S12, S7, S9, S13, S2, S3

CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE,

VIBRATION

EFFECTS/RATIONALE:

SWITCH FAILING OFF CAUSES AN OPEN CIRCUIT AND THE LOSS OF CONTROL SIGNAL TO THE ASSOCIATED RPC. REDUNDANT RPC FOR FUNCTION WOULD ALLOW OPERATION TO BE COMPLETED BUT AT A REDUCED RATE. NO EFFECT ON CREW/VEHICLE OR MISSION.

HIGHEST CRITICALITY HDW/FUNC DATE: 8/25/87 3/3 SUBSYSTEM: MECH/PBD/EPD&C FLIGHT: 3/3 MDAC ID: 5518 ABORT: MCA RELAY LOGIC POWER SWITCH ITEM: FAILURE MODE: FAILS ON SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: J. BACHER BREAKDOWN HIERARCHY: MECHANICAL ACTUATION SYSTEM PAYLOAD BAY DOORS EPD&C 2) DISPLAY AND CONTROL 3) CONTROL BUS 4) MCA RELAY LOGIC POWER SWITCH 5) 6) 7) 8) 9) CRITICALITIES HDW/FUNC HDW/FUNC ABORT FLIGHT PHASE PRELAUNCH: RTLS: TAL: LIFTOFF: 3/3 AOA: ONORBIT: 3/3 3/3 DEORBIT: ATO: LANDING/SAFING: REDUNDANCY SCREENS: A [] B [] C [PANEL MA73C LOCATION: PART NUMBER: S12, S7, S9, S13, S2, S3 CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE, CAUSES: VIBRATION EFFECTS/RATIONALE: SWITCH FAILING IN THE ON POSITION HAS NO EFFECT ON CREW/VEHICLE OR MISSION.

SUBSYSTEM: MECH/PBD/EPD&C HIGHEST CRITICALITY HDW/FUNC ABORT: 2/1R MDAC ID: 5519 REMOTE POWER CONTROLLER ITEM: FAILURE MODE: FAILS OFF LEAD ANALYST: J. BACHER SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM PAYLOAD BAY DOORS EPD&C 3) DISPLAY AND CONTROL CONTROL BUS 4) MCA RELAY LOGIC POWER SWITCH 5) REMOTE POWER CONTROLLER 7) 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE / RTLS: / TAL: 2/1R AOA: PRELAUNCH: / LIFTOFF: ONORBIT: DEORBIT: 2/1R ATO: 2/1R LANDING/SAFING: / REDUNDANCY SCREENS: A [2] B [F] C [P] LOCATION: PART NUMBER: CAUSES: CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE,

EFFECTS/RATIONALE:

VIBRATION

LOSS OF A REMOTE POWER CONTROLLER CAUSES A LOSS OF REDUNDANCY. SECOND RPC PERMITS CONTINUED PBD OPERATION WITH REDUNDANT MOTORS. NO EFFECT ON CREW/VEHICLE OR MISSION.

C.6

PAYLOAD BAY RADIATORS ANALYSIS WORKSHEETS

PAYLOAD BAY RADIATORS ANALYSIS WORKSHEETS SUMMARY

	CRITIC	ALITY	REDU	JNI	DANCY	
	FLIGHT	ABORT	SCI	REI	ENS	
MDAC-ID	H/F	H/F	A	В	С	ITEM NAME
~~~~						
6101	3/1R	/NA	P	P	P	MOTOR
6102	3/3	/NA				MOTOR BRAKE
6103	3/3	/NA				MOTOR BRAKE
6104	3/3	/NA				TORQUE LIMITER
6105	3/3	/NA				TORQUE LIMITER
6106	3/1R	/NA	P	P	P	DIFFERENTIAL ASSEMBLY
6107	3/1R	/NA	P	P	P	GEARBOX
6108	3/1R	/NA	P	₽	P	GEARBOX
6109	3/3	/NA				LIMIT SW, RELEASE (S1), (S3), (S4)
6110	3/3	/NA				LIMIT SW, LATCH (S2), (S3), (S4)
6111	3/1R	/NA	P	P	P	LATCH TORQUE SHAFT ASSEMBLY
6112	3/3	/NA				LATCH ROTARY ACTUATOR
6113	3/3	/NA				LATCH HOOK MECHANISM
6201	3/1R	/NA	P	P	P	MOTOR
6202	3/3	/NA				MOTOR BRAKE
6203	3/3	/NA				MOTOR BRAKE
6204	3/3	/NA				TORQUE LIMITER
6205	3/3	/NA				TORQUE LIMITER
6206	3/1R	/NA	P	P	P	DIFFERENTIAL ASSEMBLY
6207	3/1R	/NA	P	P	P	GEARBOX
6208	3/1R	/NA	· P	P	P	GEARBOX
6209	3/3	/NA				LIMIT SW, DEPLOY (S1,S2,S4)
6210	3/3	/NA				LIMIT SW, STOW (S1,S2,S3)
6211	3/1R	/NA	P	P	P	DEPLOYMENT TORQUE SHAFT
6212	3/3	/NA				DEPLOYMENT ROTARY ACTUATOR
6213	3/3	/NA				DEPLOYMENT CRANK AND LINK
6301	3/1R	/NA	P	P	P	HINGE FITTINGS/POINTS
6302	3/1R	/NA	P	P	P	HINGE FITTINGS/POINTS
6501	3/3	/NA				LATCH CONTROL SWITCH (S4/S6)
6502	3/3	/NA				LATCH CONTROL SWITCH (S4/S6)
6503	3/1R	/NA	P	P	P	LATCH CONTROL SWITCH (S4/S6)
6504	3/3	/NA				LATCH CONTROL SWITCH (S4/S6)
6507	3/3	/NA				RADIATOR CONTROL SWITCH (S5/S7)
6508	3/3	/NA				RADIATOR CONTROL SWITCH (S5/S7)
6509	3/1R	/NA	P	P	P	RADIATOR CONTROL SWITCH (S5/S7)
6510	3/3	/NA				RADIATOR CONTROL SWITCH (S5/S7)

^(*) Potential Critical Items.

DATE:

7/01/87

HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: MECH/PBR

FLIGHT:

3/1R

MDAC ID:

6101

ABORT:

/NA

ITEM:

MOTOR

FAILURE MODE: LOSS OF OUTPUT, FAILS TO START

LEAD ANALYST: W.T. SLAUGHTER SUBSYS LEAD: H.J. LOWERY

### BREAKDOWN HIERARCHY:

- MECHANICAL ACTUATION SYSTEM
- PLB RADIATOR DEPLOY MECHANISMS 2)
- RADIATOR LATCH SYSTEM 3)
- LATCH POWER DRIVE UNIT 4)
- MOTOR 5)

6)

7)

8)

9)

### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	/NA	RTLS:	/NA	
LIFTOFF:	/NA	TAL:	/NA	
ONORBIT:	3/3	AOA:	/NA	
DEORBIT:	3/1R	ATO:	/NA	
LANDING/SAFING	: /NA			

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION:

PAYLOAD BAY DOORS

PART NUMBER: MC287-0037-0001 (TWO MOTORS PER PDU)

CAUSES: MECHANICAL SHOCK, PIECE-PART FAILURE, TEMPERATURE, LOSS OF INPUT, VIBRATION

# EFFECTS/RATIONALE:

FAILURE OF ONE MOTOR/POWER SOURCE IN A PDU RESULTS IN TWICE THE NORMAL DRIVE TIME TO RELEASE/LATCH ONE SIX-LATCH GANG FOR THE AFFECTED RADIATOR PANEL. FAILURE OF SECOND MOTOR IS LOSS OF CAPABILITY TO RELEASE/LATCH THAT PANEL. IF UNABLE TO RELEASE, TOTAL COOLING CAPACITY IS REDUCED WHICH MAY AFFECT SOME MISSION/PAYLOAD OPERATION DEPENDENT UPON WATER CONSUMMABLES REQUIREMENTS. IF UNABLE TO LATCH, POTENTIAL EXISTS FOR INTERFERENCE WITH PLBD CLOSURE AND/OR LOOSE RADIATOR PANEL DURING DEORBIT/ENTRY.

HIGHEST CRITICALITY HDW/FUNC DATE: 7/01/87 SUBSYSTEM: MECH/PBR FLIGHT: 3/3 /NA ABORT: MDAC ID: 6102 MOTOR BRAKE ITEM: FAILURE MODE: PHYSICAL BINDING/JAMMING, FAILS TO SWITCH, FAILS TO DISENGAGE LEAD ANALYST: W.T. SLAUGHTER SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) PLB RADIATOR DEPLOY MECHANISMS 3) RADIATOR LATCH SYSTEM LATCH POWER DRIVE UNIT 4) MOTOR BRAKE 5) 6) 7) 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE RTLS: TAL: AOA: ATO: /NA /NA PRELAUNCH: /NA /NA LIFTOFF: 3/3 /NA ONORBIT: /NA DEORBIT: 3/3 LANDING/SAFING: /NA REDUNDANCY SCREENS: A [ ] B [ ] C [ ] LOCATION: PAYLOAD BAY DOORS PART NUMBER: MC287-0037-0001 (TWO MOTORS PER PDU) CAUSES: ERRONEOUS INPUT, PIECE-PART FAILURE, STRUCTURAL FAILURE, LOSS OF INPUT EFFECTS/RATIONALE: FAILURE RESULTS IN LOSS OF OUTPUT FOR AFFECTED MOTOR CAUSING TWICE THE NORMAL DRIVE TIME TO RELEASE/LATCH.

DATE: 7/01/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: MECH/PBR FLIGHT: 3/3
MDAC ID: 6103 ABORT: /NA

ITEM: MOTOR BRAKE

FAILURE MODE: PHYSICAL BINDING/JAMMING, FAILS TO SWITCH, FAILS

TO ENGAGE

LEAD ANALYST: W.T. SLAUGHTER SUBSYS LEAD: H.J. LOWERY

### BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PLB RADIATOR DEPLOY MECHANISMS
- 3) RADIATOR LATCH SYSTEM
- 4) LATCH POWER DRIVE UNIT
- 5) MOTOR BRAKE
- 6)
- 7)
- 8) 9)

### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	, /NA
DEORBIT:	3/3	ATO:	/NA
LANDING/SAFING	: /NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PAYLOAD BAY DOORS

PART NUMBER: MC287-0037-0001 (TWO MOTORS PER PDU)

CAUSES: ERRONEOUS INPUT, PIECE-PART FAILURE, STRUCTURAL FAILURE,

LOSS OF INPUT

### EFFECTS/RATIONALE:

BRAKES ARE DESIGNED TO PREVENT MOTORS FROM TURNING WHEN THE MECHANSIM IS UNPOWERED AND TO PREVENT A FAILED MOTOR FROM BEING DRIVEN VIA THE DIFFERENTIAL WHILE THE OTHER MOTOR IS TURNING. FAILURE OF A MOTOR BRAKE TO ENGAGE IS NOT DETECTABLE AND HAS NO APPARENT EFFECT UNLESS THE ASSOCIATED MOTOR FAILS. IN THIS EVENT, BACKDRIVE FROM MOTOR #2 VIA THE DIFFERENTIAL IS PROBABLE, BUT THE NEAR TERM EFFECTS ARE RELATIVELY INCONSEQUENTIAL.

HIGHEST CRITICALITY HDW/FUNC DATE: 7/01/87 SUBSYSTEM: MECH/PBR 3/3 FLIGHT: MDAC ID: 6104 ABORT: /NA TORQUE LIMITER ITEM: FAILURE MODE: FAILS OUT OF TOLERANCE - HIGH, FAILS TO SLIP LEAD ANALYST: W.T. SLAUGHTER SUBSYS LEAD: H.J. LOWERY

BREAKDOWN HIERARCHY:

- MECHANICAL ACTUATION SYSTEM
- PLB RADIATOR DEPLOY MECHANISMS 2)
- RADIATOR LATCH SYSTEM
- 4) LATCH POWER DRIVE UNIT
- TORQUE LIMITER

6)

7)

8) 9)

### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	/NA	RTLS:	/NA	
LIFTOFF:	/NA	TAL:	/NA	
ONORBIT:	3/3	AOA:	/NA	
DEORBIT:	3/3	ATO:	/NA	
LANDING/SAFING	: /NA			

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

PAYLOAD BAY DOORS LOCATION:

PART NUMBER: MC287-0037-0001 (TWO MOTORS PER PDU)

CAUSES: MECHANICAL SHOCK, PIECE-PART FAILURE, TEMPERATURE

## EFFECTS/RATIONALE:

FAILURE OF A TORQUE LIMITER CLUTCH TO SLIP IN RESPONSE TO THE PDU OUTPUT REACHING/EXCEEDING A SET LIMIT COULD RESULT IN STRUCTURAL OR MECHANICAL DAMAGE AND/OR STALLING AND OVERHEATING OF THE DRIVING MOTOR. LOSS OF ONE MOTOR RESULTS IN SINGLE MOTOR DRIVE TIME TO LATCH/RELEASE SIX-LATCH GANG FOR THAT RADIATOR PANEL.

HIGHEST CRITICALITY HDW/FUNC DATE: 7/01/87 3/3 FLIGHT: SUBSYSTEM: MECH/PBR /NA ABORT: 6105 MDAC ID: TORQUE LIMITER ITEM: FAILURE MODE: FAILS OUT OF TOLERANCE - LOW, FAILS TO ENGAGE SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: W.T. SLAUGHTER BREAKDOWN HIERARCHY: MECHANICAL ACTUATION SYSTEM 1) PLB RADIATOR DEPLOY MECHANISMS 3) RADIATOR LATCH SYSTEM LATCH POWER DRIVE UNIT 4) TORQUE LIMITER 5) 6) 7) 8) 9)

CRITICALITIES

41/11/11/11/11			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	3/3	ATO:	/NA
LANDING/SAFING	G: /NA	•	

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PAYLOAD BAY DOORS

PART NUMBER: MC287-0037-0001 (TWO MOTORS PER PDU)

CAUSES: MECHANICAL SHOCK, PIECE-PART FAILURE, TEMPERATURE

# EFFECTS/RATIONALE:

IN THIS MODE THE RIGHT CLUTCH PLATE/SPRING WASHER/FRICTION RINGS FAIL IN SUCH A MANNER AS TO ALLOW THE DRIVE GEAR TO ROTATE FREE OF THE OUTPUT SHAFT. HENCE, THE ROTARY INPUT OF ONE DRIVE MOTOR IS LOST AND THE RELEASE/LATCH STATE WILL BE EFFECTED IN SINGLE MOTOR DRIVE TIME.

DATE:

7/01/87

HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: MECH/PBR

FLIGHT:

3/1R

MDAC ID:

6106

ABORT:

/NA

ITEM:

DIFFERENTIAL ASSEMBLY

FAILURE MODE: PHYSICAL BINDING/JAMMING, STRUCTURAL FAILURE,

STRIPPED TEETH

LEAD ANALYST: W.T. SLAUGHTER SUBSYS LEAD: H.J. LOWERY

### BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- PLB RADIATOR DEPLOY MECHANISMS 2)
- RADIATOR LATCH SYSTEM 3)
- LATCH POWER DRIVE UNIT 4)
- DIFFERENTIAL ASSEMBLY 5)

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	3/1R	ATO:	/NA
LANDING/SAFING	: /NA		•

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION:

PAYLOAD BAY DOORS PART NUMBER: MC-287-0037-0001

CAUSES: MECHANICAL SHOCK, OVERLOAD, PIECE-PART FAILURE

# EFFECTS/RATIONALE:

WORSE CASE FAILURE OF THE DIFFERENTIAL ASSEMBLY IS COMPLETE LOSS OF THE OUTPUT OF A PDU AND RESULTANT INABILITY TO RELEASE/LATCH THE ASSOCIATED RADIATOR PANEL. IF UNABLE TO RELEASE, TOTAL COOLING CAPACITY IS REDUCED WHICH MAY AFFECT SOME MISSION/PAYLOAD OPERATIONS DEPENDENT UPON WATER CONSUMMABLES REQUIREMENTS. IF UNABLE TO LATCH, POTENTIAL EXISTS FOR INTERFERENCE WITH PLBD CLOSURE AND/OR LOOSE RADIATOR PANEL DURING DEORBIT/ENTRY.

DATE: 7/08/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: MECH/PBR FLIGHT: 3/1R MDAC ID: 6107 ABORT: /NA

ITEM: GEARBOX

FAILURE MODE: PHYSICAL BINDING/JAMMING, STRUCTURAL FAILURE,

FROZEN GEARS

LEAD ANALYST: W.T. SLAUGHTER SUBSYS LEAD: H.J. LOWERY

# BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PLB RADIATOR DEPLOY MECHANISMS
- 3) RADIATOR LATCH SYSTEM
- 4) LATCH POWER DRIVE UNIT
- 5) GEARBOX
- 6)
- 7)
- 8)

9)

#### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	/NA	RTLS:	/NA	
LIFTOFF:	/NA	TAL:	/NA	
ONORBIT:	3/3	AOA:	/NA	
DEORBIT:	3/1R	ATO:	/NA	
LANDING/SAFIN	•		•	

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: PAYLOAD BAY DOORS PART NUMBER: MC-287-0037-0001

CAUSES: MECHANICAL SHOCK, OVERLOAD, PIECE-PART FAILURE,

**TEMPERATURE** 

# EFFECTS/RATIONALE:

IN THIS MODE TORQUE LIMITERS WILL RELEASE AT THE PRESENT LIMIT TO ALLOW BOTH DRIVING MOTORS TO RUN FREE OF THE OUTPUT SHAFT. THIS WILL RESULT IN THE LOSS OF OUTPUT OF A PDU AND INABILITY TO RELEASE OR LATCH THE ASSOCIATED RADIATOR PANEL. IF UNABLE TO RELEASE, TOTAL COOLING CAPACITY IS REDUCED WHICH MAY AFFECT SOME MISSION/PAYLOAD OPERATIONS DEPENDENT UPON WATER CONSUMMABLES REQUIREMENTS. IF UNABLE TO LATCH, POTENTIAL EXISTS FOR INTERFERENCE WITH PLBD CLOSURE AND/OR LOOSE RADIATOR PANEL DURING DEORBIT/ENTRY.

DATE:

7/08/87

HIGHEST CRITICALITY HDW/FUNC

MDAC ID:

SUBSYSTEM: MECH/PBR 6108

FLIGHT: ABORT:

3/1R /NA

ITEM:

**GEARBOX** 

FAILURE MODE: STRUCTURAL FAILURE, LOSS OF OUTPUT, STRIPPED TEETH

LEAD ANALYST: W.T. SLAUGHTER SUBSYS LEAD: H.J. LOWERY

# BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- PLB RADIATOR DEPLOY MECHANISMS
- 3) RADIATOR LATCH SYSTEM
- LATCH POWER DRIVE UNIT 4)
- 5) GEARBOX

6)

7)

8)

9)

#### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	3/1R	ATO:	/NA
LANDING/SAFING	: /NA		·

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION:

PAYLOAD BAY DOORS

PART NUMBER: MC-287-0037-0001

CAUSES: MECHANICAL SHOCK, OVERLOAD, PIECE-PART FAILURE,

STRUCTURAL FAILURE

# EFFECTS/RATIONALE:

IN THIS MODE GEARBOX FAILS IN SUCH A MANNER AS TO TRANSMIT REDUCED OR NO ROTARY MOTION TO PDU OUTPUT SHAFT. WORSE CASE EFFECT IS COMPLETE LOSS OF PDU OUTPUT RESULTING IN INABILITY TO RELEASE OR LATCH THE AFFECTED RADIATOR PANEL. IF UNABLE TO RELEASE, TOTAL COOLING CAPACITY IS REDUCED WHICH MAY AFFECT SOME MISSION/PAYLOAD OPERATIONS DEPENDENT UPON WATER CONSUMMABLES REQUIREMENTS. IF UNABLE TO LATCH, POTENTIAL EXISTS FOR INTERFERENCE WITH PLBD CLOSURE AND/OR LOOSE RADIATOR PANEL DURING DEORBIT/ENTRY.

DATE: 7/08/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: MECH/PBR FLIGHT: 3/3 MDAC ID: 6109 ABORT: /NA

ITEM: LIMIT SWITCHES, RELEASE (S1), (S3), (S4)

FAILURE MODE: FAILS TO CLOSE, OPEN (ELECTRICAL), FAILS TO SWITCH

LEAD ANALYST: W.T. SLAUGHTER SUBSYS LEAD: H.J. LOWERY

### BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PLB RADIATOR DEPLOY MECHANISMS
- 3) RADIATOR LATCH SYSTEM
- 4) LATCH POWER DRIVE UNIT
- 5) LIMIT SWITCHES, RELEASE

6)

7) 8)

9)

### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	/NA	RTLS:	· /NA	
LIFTOFF:	/NA	TAL:	/NA	
ONORBIT:	3/3	AOA:	/NA	
DEORBIT:	3/3	ATO:	/NA	
LANDING/SAFI	NG: /NA			

LANDING/SATING. / NA

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PAYLOAD BAY DOORS PART NUMBER: MC-287-0037-0001

CAUSES: PIECE-PART FAILURE, LOSS OF INPUT, VIBRATION

# EFFECTS/RATIONALE:

FAILURE OF A REDUNDANT PAIR OF RELEASE LIMIT SWITCHES WITHIN A PDU WILL ALLOW THE MECHANISM TO CONTINUE TO DRIVE TOWARDS THE RELEASE STATE UNTIL (1) THE RELEASE COMMAND SIGNAL IS REMOVED, (2) TORQUE LIMITER SETTINGS ARE REACHED, OR (3) STRUCTURAL FAILURE IS EXPERIENCED SOME POINT IN THE DRIVE TRAIN DOWNSTREAM OF THE TORQUE LIMITERS. PORT (STARBOARD) INDICATOR, DS4 (DS2) ON PANEL R13L WILL SHOW BARBERPOLE ALTHOUGH LATCHES FOR THE AFFECTED PANEL ARE IN THE RELEASE STATE.

REFERENCES: VS70-590409, VS70-960099, SSSH DWG. N. 15.6

DATE: 7/08/87 HIGHEST CRITICALITY HDW/FUNC SUBSYSTEM: MECH/PBR FLIGHT: 3/3 MDAC ID: 6110 ABORT: /NA

MDAC ID: 6110 ABORT:

ITEM: LIMIT SWITCHES, LATCH (S2), (S3), (S4)
FAILURE MODE: FAILS TO CLOSE, OPEN (ELECTRICAL), FAILS TO SWITCH

LEAD ANALYST: W.T. SLAUGHTER SUBSYS LEAD: H.J. LOWERY

### BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PLB RADIATOR DEPLOY MECHANISMS
- 3) RADIATOR LATCH SYSTEM
- 4) LATCH POWER DRIVE UNIT
- 5) LIMIT SWITCHES, LATCH

6)

7)

8) 9)

### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	3/3	ATO:	/NA
LANDING/SAFING	: /NA		* *

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PAYLOAD BAY DOORS
PART NUMBER: MC-287-0037-0001

CAUSES: PIECE-PART FAILURE, LOSS OF INPUT, VIBRATION

# EFFECTS/RATIONALE:

FAILURE OF A REDUNDANT PAIR OF LATCH LIMIT SWITCHES WITHIN A PDU WILL ALLOW THE MECHANISM TO CONTINUE TO DRIVE TOWARDS THE LATCH STATE UNTIL (1) THE LATCH COMMAND SIGNAL IS REMOVED, (2) TORQUE LIMITER SETTINGS ARE REACHED, OR (3) STRUCTURAL FAILURE IS EXPERIENCED AT SOME POINT IN THE DRIVE TRAIN DOWNSTREAM OF THE TORQUE LIMITERS. PORT (STARBORD) INDICATOR, DS4(DS2) ON PANEL R13L WILL SHOW BARBERPOLE ALTHOUGH LATCHES FOR THE AFFECTED PANEL ARE IN THE LATCH STATE.

REFERENCES: VS70-590409, VS70-960099, SSSH DWG. N. 15.6

DATE:

7/08/87

HIGHEST CRITICALITY

HDW/FUNC

SUBSYSTEM: MECH/PBR MDAC ID:

FLIGHT:

3/1R

6111

ABORT:

/NA

ITEM:

LATCH TORQUE SHAFT ASSEMBLY

PHYSICAL BINDIND/JAMMING, STRUCTURAL FAILURE FAILURE MODE:

(RUPTURE)

LEAD ANALYST: W.T. SLAUGHTER SUBSYS LEAD: H.J. LOWERY

### BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- PLB RADIATOR DEPLOY MECHANISMS
- RADIATOR LATCH SYSTEM
- LATCH TORQUE SHAFT ASSEMBLY 4)

5)

6)

7)

8)

9)

### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	3/1R	ATO:	/NA
LANDING/SAFING:	: /NA		· ·

REDUNDANCY SCREENS:

A [ 2 ]

B[P] C[P]

LOCATION:

PAYLOAD BAY DOORS

PART NUMBER: V070-594480-001/002/003/004, V070-594490-001/002

CAUSES: MECHANICAL SHOCK, MISHANDLING/ABUSE, OVERLOAD, PIECE-

PART FAILURE, STRUCTURAL FAILURE

### EFFECTS/RATIONALE:

WITH A BROKEN/DISCONNECTED TORQUE SHAFT, AT LEAST ONE PAIR OF LATCHES WILL DRIVE TO THE RELEASE/LATCH STATE. WITH A BINDING/JAMMED SHAFT SEGMENT, TORQUE LIMITERS WILL ACTIVATE AT PRESET LIMIT TO PREVENT MOTOR BURN OUT AND CAPABILITY TO RELEASE/LATCH THE EFFECTED RADIATOR PANEL IS LOST. IF UNABLE TO LATCH, POTENTIAL EXISTS FOR INTERFERENCE WITH PLBD CLOSURE AND/OR LOOSE RADIATOR PANEL DURING DEORBIT/ENTRY.

DATE: 7/08/87 HIGHEST CRITICALITY HDW/FUNC SUBSYSTEM: MECH/PBR FLIGHT: 3/3 MDAC ID: 6112 ABORT: /NA

ITEM: LATCH ROTARY ACTUATOR FAILURE MODE: STRUCTURAL FAILURE (RUPTURE), LOSS OF OUTPUT, STRIPPED TEETH/GEARS, BROKEN OUTPUT ARM

LEAD ANALYST: W.T. SLAUGHTER SUBSYS LEAD: H.J. LOWERY

## BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PLB RADIATOR DEPLOY MECHANISMS
- 3) RADIATOR LATCH SYSTEM
- 4) LATCH ROTARY ACTUATOR
- 5)
- 6)
- 7)
- 8)
- 9)

### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	3/3	ATO:	/NA
LANDING/SAFIN	ig: /NA		·

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PAYLOAD BAY DOORS
PART NUMBER: MC-147-0016-0001

CAUSES: MECHANICAL SHOCK, OVERLOAD, PIECE-PART FAILURE,

STRUCTURAL FAILURE

### EFFECTS/RATIONALE:

IN THIS MODE PDU OUTPUT IS INTACT AND IS TRANSMITTED TO THE ROTARY ACTUATOR (IN TERMS OF EFFECT, A BINDING/JAMMED ACTUATOR IS TREATED AS A FAILED LATCH TORQUE SHAFT ASSEMBLY). DUE TO INTERNAL SLIPPAGE OR A BROKEN OUTPUT ARM, MOTION IS NOT OUTPUT TO THE LATCH HOOK MECHANISM RESULTING IN THE INABILITY TO RELEASE/LATCH THE ASSOCIATED PAIR OF LATCHES. REMAINING LATCH PAIR(S) WILL DRIVE TO THE COMMANDED STATE; INDICATORS ON PANEL R13L SHOULD SHOW BARBERPOLE ALTHOUGH REMAINING LATCHES WILL BE IN THE COMMANDED STATE.

HDW/FUNC HIGHEST CRITICALITY 7/08/87 DATE: 3/3 SUBSYSTEM: MECH/PBR FLIGHT: /NA ABORT: 6113 MDAC ID: LATCH HOOK MECHANISM ITEM: FAILS TO RELEASE/LATCH, PHYSICAL BINDING/JAMMING, FAILURE MODE:

STRUCTURAL FAILURE (RUPTURE)

SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: W.T. SLAUGHTER

### BREAKDOWN HIERARCHY:

- MECHANICAL ACTUATION SYSTEM 1)
- PLB RADIATOR DEPLOY MECHANISMS 2)
- RADIATOR LATCH SYSTEM 3)
- LATCH HOOK MECHANISM 4)

5)

6)

7) 8)

9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	/NA	RTLS:	/NA	
LIFTOFF:	/NA	TAL:	/NA	
ONORBIT:	3/3	AOA:	/NA	
DEORBIT:	3/3	ATO:	/NA	
LANDING/SAFING	: /NA		•	

B[] C[] REDUNDANCY SCREENS: A [ ]

PAYLOAD BAY DOORS LOCATION:

PART NUMBER: V070-594460-001, VS070-594470-001

CAUSES: MECHANICAL SHOCK, OVERLOAD, PIECE-PART FAILURE,

STRUCTURAL FAILURE

# EFFECTS/RATIONALE:

THE MOST PLAUSIBLE EFFECT OF A FAILED LATCH HOOK MECHANISM COMPONENT (BELLCRANK, BELLCRANK ATTACHMENT, PUSH-PULL ROD, ADJUSTABLE STOP, LINK, LATCH ROLLER) IS THE LOSS OF THE ABILITY TO RELEASE/LATCH A SINGLE LATCH. WORST CASE FAILURE IS THE LOSS OF ABILITY TO RELEASE/LATCH A LATCH PAIR. EITHER CASE IS CONSIDERED A CRITICALITY THREE (3) AS IT WILL NOT AFFECT MISSION CONTINUANCE.

DATE:

7/21/87

HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: MECH/PBR MDAC ID:

6201

FLIGHT: 3/1R ABORT:

/NA

ITEM:

MOTOR

FAILURE MODE: LOSS OF OUTPUT, FAILS TO START

LEAD ANALYST: W.T. SLAUGHTER SUBSYS LEAD: H.J. LOWERY

# BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- PLB RADIATOR DEPLOY MECHANISMS
- 3) RADIATOR DEPLOYMENT SYSTEM
- 4) DEPLOYMENT POWER DRIVE UNIT
- 5) MOTOR

6)

7)

8)

9)

### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	3/1R	ATO:	/NA
LANDING/SAFING	: /NA		

REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ]

LOCATION: PAYLOAD BAY DOORS

PART NUMBER: MC-287-0037-0002 (TWO MOTORS PER PDU)

CAUSES: MECHANICAL SHOCK, PIECE-PART FAILURE, TEMPERATURE, LOSS OF INPUT, VIBRATION

### EFFECTS/RATIONALE:

FAILURE OF ONE MOTOR/POWER SOURCE IN A PDU RESULTS IN TWICE THE NORMAL DRIVE TIME TO DEPLOY STOW THE TWO RADIATOR PANELS (PORT OR STARBOARD) DRIVEN BY THAT PDU. FAILURE OF SECOND MOTOR IS LOSS OF CAPABILITY TO DEPLOY/STOW THE AFFECTED PAIR OF PANELS. IF UNABLE TO DEPLOY, TOTAL COOLING CAPABITY IS REDUCED WHICH MAY AFFECT SOME MISSION/PAYLOAD OPERATIONS DEPENDENT UPON WATER CONSUMMABLES REQUIREMENTS. IF UNABLE TO STOW, PLBD CLOSURE IS UNLIKELY AND LOSS OF VEHICLE AND CREW MAY RESULT.

HIGHEST CRITICALITY HDW/FUNC 7/21/87 DATE: FLIGHT: 3/3 SUBSYSTEM: MECH/PBR /NA ABORT: MDAC ID: 6202

MOTOR BRAKE ITEM:

PHYSICAL BINDING/JAMMING, FAILS TO SWITCH, FAILS FAILURE MODE:

TO DISENGAGE

LEAD ANALYST: W.T. SLAUGHTER SUBSYS LEAD: H.J. LOWERY

### BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- PLB RADIATOR DEPLOY MECHANISMS
- 3) RADIATOR DEPLOYMENT SYSTEM
- DEPLOYMENT POWER DRIVE UNIT 4)
- MOTOR BRAKE 5)
- 6)
- 7)
- 8)
- 9)

#### CRITICALITIES

	V+1 V-1		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	3/3	ATO:	/NA
LANDING/SAFI	NG: /NA		·

B[] C[] REDUNDANCY SCREENS: A [ ]

PAYLOAD BAY DOORS LOCATION:

PART NUMBER: MC-287-0037-0002 (TWO MOTORS PER PDU)

CAUSES: ERRONEOUS INPUT, PIECE-PART FAILURE, STRUCTURAL FAILURE,

LOSS OF INPUT

EFFECTS/RATIONALE:

FAILURE RESULTS IN LOSS OF OUTPUT FOR AFFECTED MOTOR CAUSING

TWICE THE NORMAL DRIVE TIME TO DEPLOY/STOW.

ORBITER SUBSYSTEM ANALYSIS WORKSHEET HIGHEST CRITICALITY HDW/FUNC DATE: 7/21/87 SUBSYSTEM: MECH/PBR FLIGHT: 3/3 ABORT: /NA MDAC ID: 6203 ITEM: MOTOR BRAKE FAILURE MODE: PHYSICAL BINDING/JAMMING, FAILS TO SWITCH, FAILS TO DISENGAGE LEAD ANALYST: W.T. SLAUGHTER SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: MECHANICAL ACTUATION SYSTEM PLB RADIATOR DEPLOY MECHANISMS 2) RADIATOR DEPLOYMENT SYSTEM 3) 4) DEPLOYMENT POWER DRIVE UNIT 5) MOTOR BRAKE 6) 7)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	3/3	ATO:	/NA
LANDING/SAFIN	IG: /NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PAYLOAD BAY DOORS

PART NUMBER: MC-287-0037-0002 (TWO MOTORS PER PDU)

CAUSES: ERRONEOUS INPUT, PIECE-PART FAILURE, STRUCTURAL FAILURE,

LOSS OF INPUT

8) 9)

### EFFECTS/RATIONALE:

BRAKES ARE DESIGNED TO PREVENT MOTORS FROM TURNING WHEN THE MECHANISM IS UNPOWERED AND TO PREVENT A FAILED MOTOR FROM BEING DRIVEN VIA THE DIFFERENTIAL WHILE THE OTHER MOTOR IS TURNING. FAILURE OF A MOTOR BRAKE IS NOT DETECTABLE AND HAS NO APPARENT EFFECT UNLESS THE ASSOCIATED MOTOR FAILS. IN THIS EVENT, BACKDRIVE FROM MOTOR #2 IS PROBABLE, BUT THE NEAR-TERM EFFECTS ARE RELATIVELY INCONSEQUENTIAL.

DATE: 7/21/87 HIGHEST CRITICALITY HDW/FUNC SUBSYSTEM: MECH/PBR FLIGHT: 3/3 MDAC ID: 6204 ABORT: /NA

ITEM: TORQUE LIMITER

FAILURE MODE: FAILS OUT OF TOLERANCE-HIGH, FAILS TO SLIP

LEAD ANALYST: W.T. SLAUGHTER SUBSYS LEAD: H.J. LOWERY

#### BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PLB RADIATOR DEPLOY MECHANISMS
- 3) RADIATOR DEPLOYMENT SYSTEM
- 4) DEPLOYMENT POWER DRIVE UNIT
- 5) TORQUE LIMITER
- 6)
- 7)
- 8) 9)

#### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	3/3	ATO:	/NA
LANDING/SAFI	NG: /NA		·

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PAYLOAD BAY DOORS

PART NUMBER: MC-287-0037-0002 (TWO MOTORS PER PDU)

CAUSES: MECHANICAL SHOCK, PIECE-PART FAILURE, TEMPERATURE

### EFFECTS/RATIONALE:

FAILURE OF A TORQUE LIMITER CLUTCH TO SLIP IN RESPONSE TO THE PDU OUTPUT REACHING/EXCEEDING A SET LIMIT COULD RESULT IN STRUCTURAL OR MECHANICAL DAMAGE AND/OR STALLING AND OVERHEATING OF THE DRIVING MOTOR. LOSS OF ONE MOTOR RESULTS IN SINGLE MOTOR DRIVE TIME TO DEPLOY/STOW THE AFFECTED RADIATOR PANELS (PORT OR STARBOARD).

HIGHEST CRITICALITY HDW/FUNC DATE: 7/21/87 SUBSYSTEM: MECH/PBR FLIGHT: 3/3 ABORT: /NA MDAC ID: 6205 ITEM: TORQUE LIMITER FAILURE MODE: FAILS OUT OF TOLERANCE-LOW, FAILS TO ENGAGE LEAD ANALYST: W.T. SLAUGHTER SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM PLB RADIATOR DEPLOY MECHANISMS 2) 3) RADIATOR DEPLOYMENT SYSTEM 4) DEPLOYMENT POWER DRIVE UNIT 5) TORQUE LIMITER 6) 7) 8) 9) CRITICALITIES HDW/FUNC HDW/FUNC FLIGHT PHASE ABORT /NA RTLS: PRELAUNCH: /NA LIFTOFF: /NA TAL: /NA 3/3 /NA ONORBIT: AOA: DEORBIT: 3/3 ATO: /NA

REDUNDANCY SCREENS: A [ ] B [ ] C [

LOCATION: PAYLOAD BAY DOORS

LANDING/SAFING: /NA

PART NUMBER: MC-287-0037-0002 (TWO MOTORS PER PDV)

CAUSES: MECHANICAL SHOCK, PIECE-PART FAILURE, TEMPERATURE

EFFECTS/RATIONALE:

IN THIS MODE THE RIGHT CLUTCH PLATE/SPRING WASHER/FRICTION RINGS FAIL IN SUCH A MANNER AS TO ALLOW THE DRIVE GEAR TO ROTATE FREE OF THE OUTPUT SHAFT. HENCE, THE ROTARY OUTPUT OF ONE DRIVE MOTOR IS LOST AND THE COMMANDED DEPLOY/STATE WILL BE EFFECTED IN SINGLE MOTOR DRIVE TIME.

7/21/87

HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: MECH/PBR

FLIGHT:

3/1R

MDAC ID:

6206

ABORT:

/NA

ITEM:

DIFFERENTIAL ASSEMBLY

FAILURE MODE:

PHYSICAL BINDING/JAMMING, STRUCTURAL FAILURE,

STRIPPED TEETH

LEAD ANALYST: W.T. SLAUGHTER SUBSYS LEAD: H.J. LOWERY

#### BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- PLB RADIATOR DEPLOY MECHANISMS
- 3) RADIATOR DEPLOYMENT SYSTEM
- DEPLOYMENT POWER DRIVE UNIT 4)
- DIFFERENTIAL ASSEMBLY 5)

6)

7)

8)

9)

#### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	- 3/3	AOA:	/NA
DEORBIT:	3/1R	ATO:	/NA
LANDING/SAFIN	G: /NA		

B[P] C[P] REDUNDANCY SCREENS: A [ 2 ]

PAYLOAD BAY DOORS LOCATION: PART NUMBER: MC-287-0037-0002

CAUSES: MECHANICAL SHOCK, OVERLOAD, PIECE-PART FAILURE

# EFFECTS/RATIONALE:

WORSE CASE FAILURE OF THE DIFFERENTIAL ASSEMBLY IS COMPLETE LOSS OF THE OUTPUT OF THE PDU AND THE RESULTANT INABILITY TO DEPLOY/STOW THE ASSOCIATED PAIR OF RADIATOR PANELS (PORT OR STARBOARD). IF UNABLE TO DEPLOY, TOTAL COOLING CAPACITY IS REDUCED WHICH MAY AFFECT SOME MISSION/PAYLOAD OPERATIONS DEPENDENT UPON WATER CONSUMMABLES REQUIREMENTS. IF UNABLE TO STOW, PLBD CLOSURE IS UNLIKELY AND LOSS OF VEHICLE AND CREW MAY RESULT.

DATE:

7/21/87

HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: MECH/PBR MDAC ID:

6207

FLIGHT: ABORT:

3/1R /NA

ITEM:

**GEARBOX** 

FAILURE MODE: PHYSICAL BINDING/JAMMING, STRUCTURAL FAILURE,

FROZEN GEARS

LEAD ANALYST: W.T. SLAUGHTER SUBSYS LEAD: H.J. LOWERY

#### BREAKDOWN HIERARCHY:

- MECHANICAL ACTUATION SYSTEM 1)
- 2) PLB RADIATOR DEPLOY MECHANISMS
- RADIATOR DEPLOYMENT SYSTEM 3)
- DEPLOYMENT POWER DRIVE UNIT
- GEARBOX 5)

6)

7)

8)

9)

### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	3/1R	ATO:	/NA
LANDING/SAFING:	/NA		·

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION:

PAYLOAD BAY DOORS PART NUMBER: MC-287-0037-0002

CAUSES: MECHANICAL SHOCK, OVERLOAD, PIECE-PART FAILURE,

TEMPERATURE

# EFFECTS/RATIONALE:

IN THIS MODE TOROUE LIMITERS WILL RELEASE AT THE PRESENT LIMIT TO ALLOW BOTH DRIVING MOTORS TO RUN FREE OF THE OUTPUT SHAFT. WILL RESULT IN LOSS OF OUTPUT OF THE PDU AND INABILITY TO DEPLOY/STOW THE ASSOCIATED PAIR OF RADIATOR PANELS (PORT OR STARBOARD). IF UNABLE TO DEPLOY, TOTAL COOLING CAPACITY IS REDUCED WHICH MAY AFFECT SOME MISSION/PAYLOAD OPERATIONS DEPENDENT UPON WATER CONSUMMABLES REQUIREMENTS. IF UNABLE TO STOW, PLBD CLOSURE IS UNLIKELY AND LOSS OF VEHICLE AND CREW MAY RESULT.

REFERENCES: V070-594400; SSSH DWG. NO 14.1

REPORT DATE 11/25/87

C-634

HIGHEST CRITICALITY HDW/FUNC 7/21/87 DATE:

FLIGHT: 3/1R SUBSYSTEM: MECH/PBR ABORT: /NA MDAC ID: 6208

GEARBOX ITEM:

FAILURE MODE: STRUCTURAL FAILURE, LOSS OF OUTPUT, STRIPPED TEETH

LEAD ANALYST: W.T. SLAUGHTER SUBSYS LEAD: H.J. LOWERY

# BREAKDOWN HIERARCHY:

- MECHANICAL ACTUATION SYSTEM 1)
- PLB RADIATOR DEPLOY MECHANISMS
- RADIATOR DEPLOYMENT SYSTEM 3)
- DEPLOYMENT POWER DRIVE UNIT 4)
- **GEARBOX** 5)
- 6)
- 7)
- 8)
- 9)

#### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	3/1R	ATO:	/NA
LANDING/SAFIN	•		-

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: PAYLOAD BAY DOORS PART NUMBER: MC-287-0037-0002

CAUSES: MECHANICAL SHOCK, OVERLOAD, PIECE-PART FAILURE,

STRUCTURAL FAILURE

# EFFECTS/RATIONALE:

IN THIS MODE THE GEARBOX FAILS IN SUCH A MANNER AS TO TRANSMIT REDUCED OR NO ROTARY MOTION TO THE PDU OUTPUT SHAFT. WORSE CASE EFFECT IS COMPLETE LOSS OF OUTPUT OF THE PDU RESULTING IN INABILITY TO DEPLOY/STOW THE ASSOCIATED PAIR OF RADIATOR PANELS (PORT OR STARBOARD). IF UNABLE TO DEPLOY, TOTAL COOLING CAPACITY IS REDUCED WHICH MAY AFFECT SOME MISSION/PAYLOAD OPERATIONS. IF UNABLE TO STOW, PLBD CLOSURE IS UNLIKELY AND LOSS OF VEHICLE AND CREW MAY RESULT.

DATE: 7/21/87 HIGHEST CRITICALITY HDW/FUNC SUBSYSTEM: MECH/PBR FLIGHT: 3/3 MDAC ID: 6209 ABORT: /NA

ITEM: LIMIT SWITCHES, DEPLOY (S1, S2, S4)
FAILURE MODE: FAILS TO CLOSE, OPEN (ELECTRICAL), FAILS TO SWITCH

LEAD ANALYST: W.T. SLAUGHTER SUBSYS LEAD: H.J. LOWERY

# BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PLB RADIATOR DEPLOY MECHANISMS
- 3) RADIATOR DEPLOYMENT SYSTEM
- 4) DEPLOYMENT POWER DRIVE UNIT
- 5) LIMIT SWITCHES, DEPLOY

6) 7)

8)

9)

#### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT HDW/FU	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LĪFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	3/3	ATO:	/NA
LANDING/SAFI	NG: /NA		·

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PAYLOAD BAY DOORS PART NUMBER: MC-287-0037-0002

CAUSES: PIECE-PART FAILURE, LOSS OF INPUT, VIBRATION

### EFFECTS/RATIONALE:

FAILURE OF A REDUNDANT PAIR OF DEPLOY LIMIT SWITCHES WITHIN THE PDU WILL ALLOW THE MECHANISM TO CONTINUE TO DRIVE TOWARDS THE DEPLOY STATE UNTIL 1) THE DEPLOY COMMAND SIGNAL IS REMOVED, 2) TORQUE LIMITER SETTINGS ARE REACHED, OR 3) STRUCTURAL FAILURE IS EXPERIENCED AT SOME POINT IN THE DRIVE TRAIN DOWNSTREAM OF THE TORQUE LIMITERS. PORT (STARBOARD) INDICATOR, DS5 (DS3) ON PANEL R13L WILL SHOW BARBERPOLE ALTHOUGH THE ASSOCIATED PAIR OF RADIATOR PANELS IS IN THE DEPLOY STATE.

REFERENCES: VS70-590409; VS70-960099; SSSH DWG. NO 15.6

DATE: 7/21/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: MECH/PBR FLIGHT: 3/3
MDAC ID: 6210 ABORT: /NA

ITEM: LIMIT SWITCHES, STOW (S1, S2, S3)

FAILURE MODE: FAILS TO CLOSE, OPEN (ELECTRICAL), FAILS TO SWITCH

LEAD ANALYST: W.T. SLAUGHTER SUBSYS LEAD: H.J. LOWERY

#### BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PLB RADIATOR DEPLOY MECHANISMS
- 3) RADIATOR DEPLOYMENT SYSTEM
- 4) DEPLOYMENT POWER DRIVE UNIT
- 5) LIMIT SWITCHES, DEPLOY
- 6)
- 7)
- 8)
- 9)

#### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	3/3	ATO:	/NA
LANDING/SAFING	: /NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PAYLOAD BAY DOORS PART NUMBER: MC-287-0037-0002

CAUSES: PIECE-PART FAILURE, LOSS OF INPUT, VIBRATION

#### EFFECTS/RATIONALE:

FAILURE OF A REDUNDANT PAIR OF STOW LIMIT SWITCHES WITHIN THE PDU WILL ALLOW THE MECHANISM TO CONTINUE TO DRIVE TOWARDS THE STOW STATE UNTIL 1) THE STOW COMMAND SIGNAL IS REMOVED, 2) TORQUE LIMITER SETTINGS ARE REACHED, OR 3) STRUCTURAL FAILURE IS EXPERIENCED AT SOME POINT THE DRIVE TRAIN DOWNSTREAM OF THE TORQUE LIMITERS. PORT (STARBOARD) INDICATOR, DS5 (DS3) ON PANEL R13L WILL SHOW BARBERPOLE ALTHOUGH THE ASSOCIATED PAIR OF RADIATOR PANELS IS IN THE STOW STATE.

REFERENCES: VS70-590409; VS70-960099; SSSH DWG. NO 15.6

DATE: 7/21/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: MECH/PBR FLIGHT: 3/1R MDAC ID: 6211 ABORT: /NA

ITEM: DEPLOYMENT TORQUE SHAFT

FAILURE MODE: PHYSICAL BINDING/JAMMING, STRUCTURAL FAILURE

(RUPTURE)

LEAD ANALYST: W.T. SLAUGHTER SUBSYS LEAD: H.J. LOWERY

### BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PLB RADIATOR DEPLOY MECHANISMS
- 3) RADIATOR DEPLOYMENT SYSTEM
- 4) DEPLOYMENT TORQUE SHAFT

5)

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	3/1R	ATO:	. /NA
LANDING/SAFING:	/NA	•	

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: PAYLOAD BAY DOORS

PART NUMBER: V070-594412-001; V070-594420-001/002; V070-594480-

005

CAUSES: MECHANICAL SHOCK, MISHANDLING/ABUSE, PIECE-PART FAILURE, STRUCTURAL FAILURE

# EFFECTS/RATIONALE:

WITH A BROKEN/DISCONNECTED TORQUE SHAFT, OUTPUT OF THE PDU IS LOST TO ONE OR BOTH OF THE ROTARY ACTUATORS DEPENDENT UPON THE LOCATION OF THE BREAK. IF BOTH ACTUATORS AFFECTED, CAPABILITY TO DEPLOY/STOW THAT RADIATOR PANEL IS LOST. WITH A BINDING/JAMMED SHAFT SEGMENT, TORQUE LIMITERS WILL ACTIVATE AT THE PRESET LIMIT TO PREVENT MOTOR BURNOUT AND CAPABILITY TO DEPLOY/STOW THE AFFECTED PAIR OF RADIATOR PANELS (PORT, STARBOARD) IS LOST. IF UNABLE TO STO, POTENTIAL EXISTS FOR INTERFERENCE WITH PLBD CLOSURE AND/OR LOOSE RADIATOR PANELS DURING DEORBIT/ENTRY.

DATE: 7/21/87 HIGHEST CRITICALITY HDW/FUNC SUBSYSTEM: MECH/PBR FLIGHT: 3/3 MDAC ID: 6212 ABORT: /NA

ITEM: DEPLOYMENT ROTARY ACTUATOR

FAILURE MODE: STRUCTURAL FAILURE (RUPTURE), LOSS OF OUTPUT,

STRIPPED TEETH/GEARS, BROKEN OUTPUT ARM

LEAD ANALYST: W.T. SLAUGHTER SUBSYS LEAD: H.J. LOWERY

#### BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PLB RADIATOR DEPLOY MECHANISMS
- 3) RADIATOR DEPLOYMENT SYSTEM
- 4) DEPLOYMENT ROTARY ACTUATOR

5)

6)

7)

8) 9)

#### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	3/3	ATO:	/NA
LANDING/SAFING:	: /NA	**	

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PAYLOAD BAY DOORS
PART NUMBER: MC-147-00XX-000X

CAUSES: MECHANICAL SHOCK, OVERLOAD, PIECE-PART FAILURE,

STRUCTURAL FAILURE

#### EFFECTS/RATIONALE:

IN THIS MODE PDU OUTPUT IS INTACT AND IS TRANSMITTED TO THE ROTARY ACTUATOR (IN TERMS OF EFFECTS, A BINDING/JAMMED ACTUATOR IS TREATED AS A FAILED DEPLOYMENT TORQUE SHAFT ASSEMBLY). DUE TO INTERNAL SLIPPAGE OR A BROKEN OUTPUT ARM, MOTION IS NOT OUTPUT TO THE ASSOCIATED DEPLOYMENT CRANK. THE REMAINING ACTUATOR SHOULD OPERATE NORMALLY TO DRIVE THE RADIATOR PANEL TO THE DEPLOY STATE. THE INDICATOR ON PANEL R13L WILL SHOW DEPLOY FOR THAT RADIATOR PAIR (PORT OR STARBOARD) ALTHOUGH ONE END OF ONE PANEL MAY NOT BE FULLY DEPLOYED.

DATE: 7, SUBSYSTEM: MECH MDAC ID: 6213	H/PBR	HIGHEST C	RITICALITY FLIGHT: ABORT:	HDW/FUNC 3/3 /NA
ITEM: I FAILURE MODE: I STRUCTURAL FAILU	DEPLOYMENT CRANK AND FAILS TO DEPLOY/STOW URE (RUPTURE)	LINK , PHYSICAL	BINDING/JA	MMING,
LEAD ANALYST: W	.T. SLAUGHTER	SUBSYS LEA	D: H.J. LOW	ERY
2) PLB RADIATO 3) RADIATOR DI	RCHY: ACTUATION SYSTEM OR DEPLOY MECHANISMS EPLOYMENT SYSTEM CRANK AND LINK			
	CRITICAL	ITIES		
FI.TGHT PHASI	E HDW/FUNC	ABORT	HDW/FUN	С
PRELAUNCE	H: /NA	RTLS	: /NA	F
LIFTOFF:	/NA	TAL:	/NA	
ONORBIT:	3/3	TAL:	/NA	
DEORBIT:	3/3	ATO:	/NA	
TANDING /	SAFING: /NA	AIO.	/ NA	
LANDING/	SATING. /NA			
REDUNDANCY SCREE	ENS: A [ ]	В[]	C [ ]	
LOCATION: PART NUMBER:	AYLOAD BAY DOORS			
CAUSES:				
LINK IS LOSS OF RADIATOR PANEL. MECHANISM SHOULI THE INDICATOR ON	LE: URE OF A BROKEN/DISCO DEPLOYMENT MOTION/FO THE REMAINING ROTAL D DRIVE THE RADIATOR N PANEL R13L WILL SHO TARBOARD) ALTHOUGH OF	ORCE FOR OI RY ACTUATOI PANEL TO ! OW DEPLOY I	NE END OF O R/DEPLOYMEN' THE DEPLOY : FOR THAT RA	NE T CRANK STATE. DIATOR

REFERENCES: V070-594400; SSSH DWG. NO. 14.1

FULLY DEPLOYED.

HIGHEST CRITICALITY HDW/FUNC 7/21/87

FLIGHT: 3/1R SUBSYSTEM: MECH/PBR /NA ABORT: MDAC ID: 6301

HINGE FITTINGS/POINTS ITEM: FAILURE MODE: PHYSICAL BINDING/JAMMING

LEAD ANALYST: W.T. SLAUGHTER SUBSYS LEAD: H.J. LOWERY

#### BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- PLB RADIATOR DEPLOY MECHANISMS
- 3) RADIATOR HINGES
- 4) HINGE FITTINGS/POINTS

5)

6)

7)

8)

9)

#### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	3/1R	ATO:	/NA
LANDING/SAFING	G: /NA		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

PAYLOAD BAY DOORS/RADIATOR PANELS LOCATION:

PART NUMBER: TBD

CAUSES: MECHANICAL SHOCK, TEMPERATURE, THERMAL SHOCK,

DISTORTION/ELONGATION

#### EFFECTS/RATIONALE:

DISTORTION/WARP OF PLBD, RADIATOR PANELS, LONGERON SIL MAY OCCUR IN SUCH A MANNER AS TO CAUSE HINGES TO BIND OR JAM. WORSE CASE EFFECT OF A BINDÍNG/JAMMED RADIATOR HINGE IS LOSS A THE CAPABILITY TO STOW A DEPLOYED RADIATOR PANEL. IF UNABLE TO STOW POTENTIAL EXISTS FOR INTERFERENCE WITH PLBD CLOSURE AND/OR LOOSE RADIATOR PANEL DURING DEORBIT/ENTRY.

REFERENCES: TBD

DATE:

7/21/87

HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: MECH/PBR MDAC ID: 6302

FLIGHT: 3/1R ABORT:

/NA

ITEM:

HINGE FITTINGS/POINTS

FAILURE MODE: STRUCTURAL FAILURE, FRACTURE

LEAD ANALYST: W.T. SLAUGHTER SUBSYS LEAD: H.J. LOWERY

### BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) PLB RADIATOR DEPLOY MECHANISMS
- 3) RADIATOR HINGES
- 4) HINGE FITTINGS/POINTS

5)

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	3/1R	ATO:	/NA
LANDING/SAFING	: /NA		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: PAYLOAD BAY DOORS/RADIATOR PANELS

PART NUMBER: TBD

CAUSES: PIECE-PART FAILURE, STRUCTURAL FAILURE,

DISTORTION/ELONGATION

#### EFFECTS/RATIONALE:

EFFECTS OF FRACTURED HINGE PARTS, SHEARED/MISSING HINGE PINS ARE NIL IF THE FAILURE IS ISOLATED TO A SINGLE HINGE/HINGE POINT. WORSE CASE EFFECT WOULD BE THE FAILURE OF TWO ADJACENT HINGES/HINGE POINTS WITH THE RADIATORS IN THE DEPLOY STATE IN WHICH CASE THE ABILITY TO STOW THE RADIATOR AND CLOSE THE PLBD MAY BE JEOPARDIZED.

REFERENCES: TBD

HDW/FUNC HIGHEST CRITICALITY 7/22/87 FLIGHT: 3/3 SUBSYSTEM: MECH/PBR/EPD&C

/NA ABORT: 6501 MDAC ID:

LATCH CONTROL SWITCH (S4/S6)

FAILS TO RELEASE, OPEN (ELECTRICAL), FAILS TO FAILURE MODE:

SWITCH

LEAD ANALYST: W.T. SLAUGHTER SUBSYS LEAD: H.J. LOWERY

# BREAKDOWN HIERARCHY:

- MECHANICAL ACTUATION SYSTEM
- PLB RADIATOR DEPLOY MECHANISMS
- 3) PLB RADIATOR EPD&C
- LATCH CONTROL 4)
- CONTROL SWITCH (S4/S6)

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING	: /NA		

C [ ] B [ ] REDUNDANCY SCREENS: A [ ]

PANEL R13L LOCATION: PART NUMBER: (\$4/\$6)

PIECE-PART FAILURE, LOSS OF INPUT, VIBRATION CAUSES:

# EFFECTS/RATIONALE:

WITH SELECTION OF RELEASE POSITION ON SWITCHES S4 AND S6, EFFECT OF A SINGLE FAILURE IS TO PRECLUDE CONTROL POWER FROM BEING PASSED TO THE MMCA'S (TWO ASSOCIATED WITH EACH SWITCH) CAUSING LOSS OF SINGLE (REDUNDANT) MOTOR IN EACH LATCH POWER DRIVE UNIT WITH RELEASE FUNCTION OCCURING IN SINGLE MOTOR DRIVE TIME (TWICE NORMAL). SECOND FAILURE IS LOSS OF CAPABILITY TO RELEASE RADIATORS WHICH MAY AFFECT SOME MISSION/PAYLOAD OPERATIONS DEPENDENT UPON WATER CONSUMMABLES REQUIREMENTS. PARTIAL SWTICH FAILURE (CONTACT OPEN) RESULTS IN THE LOSS OF USE OF A RADIATOR PAIR (PORT OR STARBOARD) AND SHOULD NOT AFFECT MISSION CONTINUANCE.

HIGHEST CRITICALITY HDW/FUNC 7/22/87 DATE: SUBSYSTEM: MECH/PBR/EPD&C FLIGHT: 3/3 /NA MDAC ID: 6502 ABORT: LATCH CONTROL SWITCH (S4/S6) ITEM: FAILURE MODE: FAILS IN RELEASE, FAILS TO SWITCH, SHORTED LEAD ANALYST: W.T. SLAUGHTER SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM PLB RADIATOR DEPLOY MECHANISMS 2) PLB RADIATOR EPD&C 4) LATCH CONTROL CONTROL SWITCH (S4/S6) 6) 7) 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE RTLS: /NA PRELAUNCH: /NA LIFTOFF: /NA TAL: /NA 3/3 AOA: /NA ONORBIT: DEORBIT: /NA LANDING/SAFING: /NA ATO: /NA REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL R13L PART NUMBER: (\$4/\$6)

CAUSES: CONTAMINATION, PIECE-PART FAILURE, VIBRATION, DEBRIS

#### EFFECTS/RATIONALE:

WITH DESELECTION OF RELEASE POSITION ON SWITCHES S4 AND S6, EFFECT OF A SHORT ACROSS A CONTACT PAIR IS TO ALLOW CONTINUOUS POWER TO BE APPLIED TO THE CONTROL UNIT OF A SINGLE, GATED RELAY DRIVER/RELAY. THE INVERTED "AND" SIGNAL AT THAT GATE WILL OPERATE AS NORMAL TO REMOVE THE POWER FROM THE RELAY DRIVER/RELAY WHEN THE PDU LIMIT SWITCH REACHES THE RELEASED STATE. RELEASE COMMAND SIGNAL SHOULD BE REMOVED WHEN PLB MECH PWR SYS1/SYS2 SWITCH (S1/S2) PLACED TO OFF.

7/22/87 DATE:

HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: MECH/PBR/EPD&C

FLIGHT:

3/1R

MDAC ID:

6503

ABORT:

/NA

ITEM:

LATCH CONTROL SWITCH (S4/S6)

FAILURE MODE: FAILS TO LATCH, OPEN (ELECTRICAL), FAILS TO SWITCH

LEAD ANALYST: W.T. SLAUGHTER SUBSYS LEAD: H.J. LOWERY

#### BREAKDOWN HIERARCHY:

- MECHANICAL ACTUATION SYSTEM
- PLB RADIATOR DEPLOY MECHANISMS
- 3) PLB RADIATOR EPD&C
- LATCH CONTROL 4)
- 5) CONTROL SWITCH (S4/S6)

6)

7)

8)

9)

#### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	3/1R	ATO:	/NA
LANDING/SAFING			

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

PANEL R13L LOCATION: PART NUMBER: (S4/S6)

CAUSES: PIECE-PART FAILURE, LOSS OF INPUT, VIBRATION

### EFFECTS/RATIONALE:

WITH SELECTION OF LATCH POSITION ON SWITCHES S4 AND S6, EFFECT OF A SINGLE FAILURE IS TO PRECLUDE CONTROL POWER FROM BEING PASSED TO THE MMCA'S (TWO ASSOCIATED WITH EACH SWITCH) CAUSING LOSS OF SINGLE (REDUNDANT) MOTOR IN EACH LATCH POWER DRIVE UNIT WITH LATCH FUNCTION OCCURING IN SINGLE MOTOR DRIVE TIME (TWICE NORMAL). SECOND FAILURE IS LOSS OF CAPABILITY TO LATCH RADIATORS. IF UNABLE TO LATCH, POTENTIAL EXISTS FOR INTERFERENCE WITH PLBD CLOSURE AND/OR LOOSE RADIATOR PANEL(S) DURING DEORBIT/ENTRY.

DATE:

7/22/87

HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: MECH/PBR/EPD&C MDAC ID:

6504

FLIGHT: ABORT:

3/3 /NA

ITEM:

LATCH CONTROL SWITCH (S4/S6)

FAILURE MODE: FAILS IN LATCH, FAILS TO SWITCH, SHORTED

LEAD ANALYST: W.T. SLAUGHTER SUBSYS LEAD: H.J. LOWERY

# BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- PLB RADIATOR DEPLOY MECHANISMS
- 3) PLB RADIATOR EPD&C
- 4) LATCH CONTROL
- CONTROL SWITCH (S4/S6)

6) 7)

8)

9)

#### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFIN	G: /NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: R13L

PART NUMBER: (\$4/\$6)

CAUSES: CONTAMINATION, PIECE-PART FAILURE, VIBRATION, DEBRIS

#### EFFECTS/RATIONALE:

WITH DESELECTION OF LATCH POSITION ON SWITCHES S4 AND S6, EFFECT OF A SHORT ACROSS A CONTACT PAIR IS TO ALLOW CONTINUOUS POWER TO BE APPLIED TO THE CONTROL INPUT OF A SINGLE, GATED RELAY DRIVER/RELAY. THE INVERTED "AND" SINGNAL AT THAT GATE OPERATE AS NORMAL TO REMOVE THE POWER FROM THE RELAY DRIVER/RELAY WHEN THE PDU LIMIT SWITCH REACHES THE LATCH STATE. LATCH COMMAND SIGNAL SHOULD BE REMOVED WHEN PLB MECH PWR SYS1/SYS2 SWITCH (S1/S2) PLACED TO OFF.

HIGHEST CRITICALITY HDW/FUNC 7/22/87 DATE: 3/3 SUBSYSTEM: MECH/PBR/EPD&C FLIGHT: /NA ABORT: 6507 MDAC ID:

RADIATOR CONTROL SWITCH (S5/S7) ITEM:

FAILURE MODE: FAILS TO DEPLOY, OPEN (ELECTRICAL), FAILS TO

SWITCH

LEAD ANALYST: W.T. SLAUGHTER SUBSYS LEAD: H.J. LOWERY

#### BREAKDOWN HIERARCHY:

- MECHANICAL ACTUATION SYSTEM
- PLB RADIATOR DEPLOY MECHANISMS 2)
- PLB RADIATOR EPD&C 3)
- 4) RADIATOR CONTROL
- CONTROL SWITCH (S5/S7)

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	· /NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFIN	G: /NA		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: PANEL R13L PART NUMBER: (S5/S7)

CAUSES: PIECE-PART FAILURE, LOSS OF INPUT, VIBRATION

#### EFFECTS/RATIONALE:

WITH SELECTION OF DEPLOY POSITON ON SWITCHES S5 AND S7, EFFECT OF A SINGLE FAILURE IS TO PRECLUDE CONTROL POWER FROM BEING PASSED TO THE MMCA'S (TWO ASSOCIATED WITH EACH SWITCH) CAUSING LOSS OF SINGLE (REDUNDANT) MOTOR IN EACH DEPLOYMENT POWER DRIVE UNIT WITH DEPLOY FUNCTION OCCURING IN SINGLE MOTOR DRIVE TIME (TWICE NORMAL). SECOND FAILURE IS LOSS OF CAPABILITY TO DEPLOY RADIATORS WHICH MAY AFFECT SOME MISSION/PAYLOAD OPERATIONS DEPENDENT UPON WATER CONSUMMABLES REQUIREMENTS. PARTIAL SWITCH FAILURE (CONTACT OPEN) RESULTS IN LOSS OF USE OF A RADIATOR PAIR (PORT OR STARBARD) AND SHOULD NOT AFFECT MISSION CONTINUANCE.

HIGHEST CRITICALITY HDW/FUNC 7/22/87 SUBSYSTEM: MECH/PBR/EPD&C FLIGHT: 3/3 ABORT: /NA MDAC ID: 6508 RADIATOR CONTROL SWITCH (S5/S7) ITEM: FAILURE MODE: FAILS IN DEPLOY, FAILS TO SWITCH, SHORTED SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: W.T. SLAUGHTER BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM PLB RADIATOR DEPLOY MECHANISMS 2) 3) PLB RADIATOR EPD&C RADIATOR CONTROL CONTROL SWITCH (S5/S7) 5) 6) 7) 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE RTLS: /NA PRELAUNCH: /NA /NA /NA TAL: LIFTOFF: 3/3 AOA: ONORBIT: /NA ATO: DEORBIT: LANDING/SAFING: /NA REDUNDANCY SCREENS: A [ ] C [ B [ ] ] PANEL R13L LOCATION: PART NUMBER: (S5/S7) CAUSES: CONTAMINATION, PIECE-PART FAILURE, VIBRATION, DEBRIS EFFECTS/RATIONALE: WITH DESELECTION OF DEPLOY POSITION ON SWITCHES S5 AND S7, EFFECT OF A SHORT ACROSS A CONTACT PAIR IS TO ALLOW CONTINUOUS POWER TO

REFERENCES: VS70-590409; SSSH DWG. NO. 15.6

SWITCH (S1/S2) PLACED TO OFF.

BE APPLIED TO THE CONTROL INPUT OF A SINGLE, GATED RELAY DRIVER/RELAY. THE INVERTED "AND" SIGNAL AT THAT GATE WILL

OPERATE AS NORMAL TO REMOVE THE POWER FROM THE RELAY DRIVER/RELAY WHEN THE PDU LIMIT SWITCH REACHES THE DEPLOYED STATE. DEPLOY COMMAND SIGNAL SHOULD BE REMOVED WHEN PLB MECH PWR SYS1/SYS2

7/22/87 DATE:

HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM:

MECH/PBR/EPD&C

FLIGHT:

3/1R

MDAC ID:

ABORT:

/NA

ITEM:

6509

RADIATOR CONTROL SWITCH (S5/S7)

FAILS TO STOW, OPEN (ELECTRICAL), FAILS TO SWITCH FAILURE MODE:

LEAD ANALYST: W.T. SLAUGHTER SUBSYS LEAD: H.J. LOWERY

# BREAKDOWN HIERARCHY:

- MECHANICAL ACTUATION SYSTEM
- PLB RADIATOR DEPLOY MECHANISMS 2)
- PLB RADIATOR EPD&C 3)
- 4) RADIATOR CONTROL
- CONTROL SWITCH (S5/S7) 5)

6)

7)

8)

9)

#### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	3/1R	ATO:	/NA
LANDING/SAFING	•		·

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: PANEL R13L PART NUMBER: (S5/S7)

CAUSES: PIECE-PART FAILURE, LOSS OF INPUT, VIBRATION

# EFFECTS/RATIONALE:

WITH SELECTION OF STOW POSITION ON SWITCHES S5 AND S7, EFFECT OF A SINGLE FAILURE IS TO PRECLUDE CONTROL POWER FROM BEING PASSED TO THE MMCA'S (TWO ASSOCIATED WITH EACH SWITCH) CAUSING LOSS OF SINGLE (REDUNDANT) MOTOR IN EACH DEPLOYMENT POWER DRIVE UNIT WITH STOW FUNCTION OCCURING IN SINGLE MOTOR DRIVE TIME (TWICE NORMAL). SECOND FAILURE IS LOSS OF CAPABILITY TO STOW RADIATORS REQUIRING CREW EVA TO MECHANICALLY DISCONNECT AND STOW RADIATOR PANELS. DEPLOYED RADIATORS INTERFERE WITH PLBD CLOSURE WHICH MAY RESULT IN LOSS OF VEHICLE AND CREW.

HIGHEST CRITICALITY HDW/FUNC 7/22/87 DATE: SUBSYSTEM: MECH/PBR/EPD&C FLIGHT: 3/3 ABORT: /NA MDAC ID: 6510 RADIATOR CONTROL SWITCH (S5/S7) ITEM: FAILURE MODE: FAILS IN STOW, FAILS TO SWITCH, SHORTED LEAD ANALYST: W.T. SLAUGHTER SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM PLB RADIATOR DEPLOY MECHANISMS PLB RADIATOR EPD&C 3) RADIATOR CONTROL 4)

CRITTCALITTES

	O1(1 1 1 O1)		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	/NA	RTLS:	/NA
LIFTOFF:	/NA	TAL:	/NA
ONORBIT:	3/3	AOA:	/NA
DEORBIT:	/NA	ATO:	/NA
LANDING/SAFING	: /NA		

C [ REDUNDANCY SCREENS: A [ ] B [ ]

LOCATION: PANEL R13L PART NUMBER: (S5/S7)

CONTROL SWITCH (S5/S7)

CAUSES: CONTAMINATION, PIECE-PART FAILURE, VIBRATION, DEBIRS

#### EFFECTS/RATIONALE:

6) 7) 8) 9)

WITH DESELECTION OF STOW POSITION ON SWITCHES S5 AND S7, EFFECT OF A SHORT ACROSS A CONTACT PAIR IS TO ALLOW CONTINUOUS POWER TO BE APPLIED TO THE CONTROL INPUT OF A SINGLE, GATED RELAY DRIVER/RELAY. THE INVERTED "AND" SIGNAL AT THAT GATE WILL OPERATE AS NORMAL TO REMOVE THE POWER FROM THE RELAY DRIVER/RELAY WHEN THE PDU LIMIT SWITCH REACHES THE STOWED STATE. STOW COMMAND SIGNAL SHOULD BE REMOVED WHEN PLB MECH PWR SYS1/SYS2 SWITCH (S1/S2) PLACED TO OFF.

C.7

PERSONNEL HATCH ANALYSIS WORKSHEETS

# PERSONNEL HATCH ANALYSIS WORKSHEETS SUMMARY

	CRITIC		REDUNDANCY	
	FLIGHT	ABORT	SCREENS	
MDAC-ID	H/F	H/F	ABC	ITEM NAME
7100 *	3/1R	/NA	PFP	PRESSURE PORT
7101 *	1/1	/NA		PRESSURE PORT
7102 *	3/1R	/NA	PFP	O RING
7103 *	3/1R	/NA	PFP	O RING
7104 *	3/1R	/NA	PFP	VIEWPORT
7105	3/1R	/NA	PPP	VIEWPORT
7106 *	3/1R	/NA	PFP	ACTUATOR
7107 *	3/1R	/NA	PFP	ACTUATOR
7108 *	3/1R	/NA	PFP	ACTUATOR
7109 *	3/2R	/NA	PFP	ACTUATOR
7110 *	3/2R	/NA	PFP	ACTUATOR
7111 *	3/2R	/NA	PFP	ACTUATOR
7112 *	3/1R	/NA	PFP	O RING
7113 *	3/1R	/NA	P F P	O RING
7114 *	3/1R	/NA	PFP	VIEWPORT
7115	3/1R	/NA	PPP	VIEWPORT
7116	3/3	/NA		VIEWPORT LATCH
7117	3/3	/NA		VIEWPORT LATCH
7118	3/3	3/3		BOOT
7119	3/3	3/3		DRAIN TUBING
7120	3/3	3/3	•	DRAIN TUBING

^(*) Potential Critical Items.

DATE: 7/08/87 H SUBSYSTEM: MECH/PH MDAC ID: 7100	IIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/1R ABORT: /
ITEM: PRESSURE PORT FAILURE MODE: CLOGGED	,
LEAD ANALYST: A.D. MONTGOMERY S	UBSYS LEAD: H.J. LOWERY
BREAKDOWN HIERARCHY:  1) MECHANICAL ACTUATION SYSTEM  2) PERSONNEL HATCHES  3) AIRLOCK  4)  5)  6)  7)  8)	
CRITICALIT	TES
FLIGHT PHASE HDW/FUNC	ABORT HDW/FUNC
PRELAUNCH: /	RTLS: /
LIFTOFF: /	TAL:
LIFTOFF: / ONORBIT: 3/1R	AOA: /
DEORBIT: /	ATO: /
LANDING/SAFING: /	
REDUNDANCY SCREENS: A [ 2 ] B	[ F ] C [ P ]
LOCATION: MIDDECK PART NUMBER: MA.AL.1	
CAUSES: DEBRIS IN PORT	
EFFECTS/RATIONALE: AIRLOCK PRESSURE MAY NOT BE ABLE TO F AND/OR MIDDECK. THIS COULD CAUSE THE BECAUSE OF HIGHER PRESSURE INSIDE.	EQUALIZE WITH PAYLOAD BAY E AIRLOCK HATCH B TO NOT OPEN

DATE: 7/08/87 SUBSYSTEM: MECH/PH MDAC ID: 7101	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 1/1 ABORT: /
ITEM: PRESSURE PORT FAILURE MODE: LEAKAGE	
LEAD ANALYST: A.D. MONTGOMERY	SUBSYS LEAD: H.J. LOWERY
BREAKDOWN HIERARCHY:  1) MECHANICAL ACTUATION SYSTEM  2) PERSONNEL HATCHES  3) AIRLOCK  4)  5)  6)  7)  8)	
CRITICALI	
FLIGHT PHASE HDW/FUNC PRELAUNCH: / LIFTOFF: / ONORBIT: 1/1 DEORBIT: / LANDING/SAFING: /	ABORT HDW/FUNC RTLS: / TAL: / AOA: / ATO: /
REDUNDANCY SCREENS: A [ ] E	3 [ ] C [ ]
LOCATION: MIDDECK PART NUMBER: MA.AL.1	
CAUSES: PIECE-PART STRUCTURAL FAILU	JRE
EFFECTS/RATIONALE: ATMOSPHERE LEAKAGE THROUGH THE PRESS LIFE.	SURE PORT COULD CAUSE LOSS OF

HIGHEST CRITICALITY HDW/FUNC 7/08/87 DATE: FLIGHT: 3/1R SUBSYSTEM: MECH/PH ABORT: 7102 MDAC ID: ITEM: O RING FAILURE MODE: LEAKAGE SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: A.D. MONTGOMERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM PERSONNEL HATCHES 2) 3) AIRLOCK 4) 5) 6) 7) 8) 9) CRITICALITIES HDW/FUNC HDW/FUNC ABORT FLIGHT PHASE PRELAUNCH: RTLS: TAL: LIFTOFF: 3/1R AOA: ONORBIT: ATO: **DEORBIT:** LANDING/SAFING: REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ] LOCATION: MIDDECK PART NUMBER: MA.AL.2 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: ATMOSPHERE LEAKAGE THROUGH THE O RING COULD CAUSE LOSS OF LIFE. REFERENCES:

HIGHEST CRITICALITY HDW/FUNC DATE: 7/08/87 SUBSYSTEM: MECH/PH FLIGHT: 3/1R ABORT: MDAC ID: 7103 O RING ITEM: FAILURE MODE: CRACKED LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM PERSONNEL HATCHES 2) AIRLOCK 3) 4) 5) 6) 7) 8) 9) CRITICALITIES HDW/FUNC FLIGHT PHASE HDW/FUNC ABORT PRELAUNCH: / RTLS: LIFTOFF: TAL: 3/1R AOA: ONORBIT: DEORBIT: ATO: LANDING/SAFING: REDUNDANCY SCREENS: A [ 2 ] B[F] C[P] MIDDECK LOCATION: PART NUMBER: MA.AL.2 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: A CRACKED O RING COULD CAUSE LEAKAGE OF ATMOSPHERE THROUGH THE O RING. THIS COULD CAUSE LOSS OF LIFE.

HIGHEST CRITICALITY HDW/FUNC 7/08/87 DATE: FLIGHT: 3/1R SUBSYSTEM: MECH/PH ABORT: MDAC ID: 7104 VIEWPORT ITEM: LEAKAGE FAILURE MODE: SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: A.D. MONTGOMERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM PERSONNEL HATCHES 2) 3) AIRLOCK 4) 5) 6) 7) 8) 9) CRITICALITIES ABORT HDW/FUNC HDW/FUNC FLIGHT PHASE RTLS: PRELAUNCH: TAL: LIFTOFF: 3/1R AOA: **ONORBIT:** ATO: **DEORBIT:** LANDING/SAFING: A [ 2 ] B [ F ] C [ P ] REDUNDANCY SCREENS: MIDDECK LOCATION: PART NUMBER: MA.AL.3 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: ATMOSPHERE LEAKAGE THROUGH THE VIEWPORT COULD CAUSE LOSS OF LIFE.

7/08/87 HIGHEST CRITICALITY HDW/FUNC DATE: SUBSYSTEM: MECH/PH FLIGHT: 3/1R ABORT: MDAC ID: 7105 ITEM: VIEWPORT FAILURE MODE: CRACKED SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: A.D. MONTGOMERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) PERSONNEL HATCHES AIRLOCK 3) 4) 5) 6) 7) 8) 9) CRITICALITIES FLIGHT PHASE HDW/FUNC ABORT HDW/FUNC RTLS: PRELAUNCH: / LIFTOFF: TAL: AOA: ONORBIT: 3/1R DEORBIT: ATO: LANDING/SAFING: B[P] C[P] REDUNDANCY SCREENS: A [ 2 ] MIDDECK LOCATION: PART NUMBER: MA.AL.3 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: ATMOSPHERE LEAKAGE THROUGH THE VIEWPOINT COULD CAUSE LOSS OF LIFE.

DATE: 7/08/87 SUBSYSTEM: MECH/PH MDAC ID: 7106	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/1R ABORT: /
ITEM: ACTUATOR FAILURE MODE: BROKEN GEAR	
LEAD ANALYST: A.D. MONTGOMERY	SUBSYS LEAD: H.J. LOWERY
BREAKDOWN HIERARCHY:  1) MECHANICAL ACTUATION SYSTEM 2) PERSONNEL HATCHES 3) AIRLOCK 4) 5) 6) 7) 8)	
CRITICAL	ITIES
FLIGHT PHASE HDW/FUNC PRELAUNCH: / LIFTOFF: / ONORBIT: 3/1R DEORBIT: / LANDING/SAFING: /	ABORT HDW/FUNC RTLS: / TAL: / AOA: / ATO: /
REDUNDANCY SCREENS: A [ 2 ]	B [ F ] C [ P ]
LOCATION: MIDDECK PART NUMBER: MA.AL.4	
CAUSES: PIECE-PART STRUCTURAL FAIL	URE
EFFECTS/RATIONALE: A BROKEN ACTUATOR WOULD PREVENT OPE COULD PREVENT AN EVA TO CLOSE THE F	NING OF THE AIRLOCK. THIS PAYLOAD BAY DOORS, ETC.

HIGHEST CRITICALITY HDW/FUNC DATE: 7/08/87 SUBSYSTEM: MECH/PH FLIGHT: 3/1R ABORT: MDAC ID: 7107 **ACTUATOR** ITEM: FAILURE MODE: BROKEN SHAFT SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: A.D. MONTGOMERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) PERSONNEL HATCHES 3) AIRLOCK 4) 5) 6) 7) 8) 9) CRITICALITIES ABORT HDW/FUNC FLIGHT PHASE HDW/FUNC RTLS: PRELAUNCH: / TAL: LIFTOFF: 3/1R AOA: ONORBIT: ATO: DEORBIT: / LANDING/SAFING: REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ] LOCATION: MIDDECK PART NUMBER: MA.AL.4 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: A BROKEN ACTUATOR WOULD PREVENT OPENING OF THE AIRLOCK. COULD PREVENT AN EVA TO CLOSE THE PAYLOAD BAY DOORS, ETC.

HIGHEST CRITICALITY HDW/FUNC DATE: 7/08/87 3/1R FLIGHT: SUBSYSTEM: MECH/PH ABORT: MDAC ID: 7108 **ACTUATOR** ITEM: FAILURE MODE: JAMMED SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: A.D. MONTGOMERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM PERSONNEL HATCHES 2) 3) AIRLOCK 4) 5) 6) 7) 8) 9) CRITICALITIES FLIGHT PHASE HDW/FUNC ABORT HDW/FUNC RTLS: / PRELAUNCH: TAL: LIFTOFF: 3/1R AOA: ONORBIT: ATO: DEORBIT: LANDING/SAFING: REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ] MIDDECK LOCATION: PART NUMBER: MA.AL.4 CAUSES: DEBRIS IN ACTUATOR EFFECTS/RATIONALE: A JAMMED ACTUATOR WOULD PREVENT OPENING OF THE AIRLOCK. THIS COULD PREVENT AN EVA TO CLOSE THE PAYLOAD BAY DOORS, ETC.

HDW/FUNC DATE: 7/08/87 HIGHEST CRITICALITY FLIGHT: SUBSYSTEM: MECH/PH 3/2R ABORT: MDAC ID: 7109 ACTUATOR ITEM: FAILURE MODE: BROKEN GEAR LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM PERSONNEL HATCHES 2) SIDE HATCH 3) 4) 5) 6) 7) 8) 9) CRITICALITIES HDW/FUNC FLIGHT PHASE HDW/FUNC ABORT PRELAUNCH: 3/2R RTLS: LIFTOFF: TAL: AOA: ONORBIT: ATO: DEORBIT: LANDING/SAFING: REDUNDANCY SCREENS: A [ 2 ] B [ F ] C [ P ] LOCATION: MIDDECK PART NUMBER: MA.SH.1 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: A BROKEN ACTUATOR DURING PRELAUNCH COULD CAUSE LOSS OF MISSION.

HIGHEST CRITICALITY HDW/FUNC 7/08/87 DATE: 3/2R FLIGHT: SUBSYSTEM: MECH/PH ABORT: MDAC ID: 7110 ACTUATOR ITEM: BROKEN SHAFT FAILURE MODE: LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM PERSONNEL HATCHES 2) SIDE HATCH 3) 4) 5) 6) 7) 8) 9) CRITICALITIES ABORT HDW/FUNC HDW/FUNC FLIGHT PHASE RTLS: PRELAUNCH: TAL: LIFTOFF: 3/2R AOA: ONORBIT: ATO: DEORBIT: LANDING/SAFING: B [ F ] C [ P ] A [ 2 ] REDUNDANCY SCREENS: LOCATION: MIDDECK PART NUMBER: MA.SH.1 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: A BROKEN ACTUATOR DURING PRELAUNCH COULD CAUSE LOSS OF MISSION.

7/08/87 HIGHEST CRITICALITY HDW/FUNC DATE: FLIGHT: SUBSYSTEM: MECH/PH 3/2R ABORT: MDAC ID: 7111 ITEM: **ACTUATOR** FAILURE MODE: JAMMED LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) PERSONNEL HATCHES SIDE HATCH 3) 4) 5) 6) 7) 8) 9) CRITICALITIES HDW/FUNC FLIGHT PHASE HDW/FUNC ABORT RTLS: PRELAUNCH: LIFTOFF: TAL: 3/2R AOA: ONORBIT: DEORBIT: ATO: LANDING/SAFING: вггі REDUNDANCY SCREENS: A [ 2 ] C [ P ] LOCATION: MIDDECK PART NUMBER: MA.SH.1 CAUSES: DEBIR IN ACTUATOR EFFECTS/RATIONALE: A JAMMED ACTUATOR DURING PRELAUNCH COULD CAUSE LOSS OF MISSION.

HIGHEST CRITICALITY HDW/FUNC DATE: 7/08/87 3/1R FLIGHT: SUBSYSTEM: MECH/PH ABORT: MDAC ID: 7112 O RING ITEM: FAILURE MODE: CRACKED SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: A.D. MONTGOMERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM PERSONNEL HATCHES 2) SIDE HATCH 3) 4) 5) 6) 7) 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE PRELAUNCH: RTLS: TAL: LIFTOFF: 3/1R AOA: ONORBIT: ATO: DEORBIT: LANDING/SAFING: A.[2] B[F] C [ P ] REDUNDANCY SCREENS: LOCATION: MIDDECK PART NUMBER: MA.SH.2 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: A CRACKED O RING COULD CAUSE LEAKAGE OF ATMOSPHERE THROUGH THE O RING. THIS COULD CAUSE LOSS OF LIFE.

DATE: 7/08/87 SUBSYSTEM: MECH/PH MDAC ID: 7113		HIGHEST	FLI	CALITY GHT: RT:	HDW/FUNC 3/1R
ITEM: O RING FAILURE MODE: LEAKAGE				eng in the	
LEAD ANALYST: A.D. MONTGOM	ERY	SUBSYS I	EAD:	H.J. LOV	VERY
BREAKDOWN HIERARCHY:  1) MECHANICAL ACTUATION 2) PERSONNEL HATCHES 3) SIDE HATCH 4) 5) 6) 7) 8)	SYSTEM				
· · · · · · · · · · · · · · · · · · ·	CRITICAL	TTTES			,
PRELAUNCH: // LIFTOFF: // ONORBIT: 3/ DEORBIT: //	FUNC		ւs։ Ա:	HDW/FUNC / / /	:
LANDING/SAFING: /	, ,		-	. D. 1	
REDUNDANCY SCREENS: A [ LOCATION: MIDDECK PART NUMBER: MA.SH.2  CAUSES: PIECE-PART STRUCT  EFFECTS/RATIONALE: ATMOSPHERE LEAKAGE THROUGH	TURAL FAILU		-	[P]	FIRE.

DATE: 7/08/87 SUBSYSTEM: MECH/PH MDAC ID: 7114	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/1R ABORT: /
ITEM: VIEWPORT FAILURE MODE: LEAKAGE	
LEAD ANALYST: A.D. MONTGOMERY	SUBSYS LEAD: H.J. LOWERY
BREAKDOWN HIERARCHY:  1) MECHANICAL ACTUATION SYSTEM  2) PERSONNEL HATCHES  3) SIDE HATCH  4)  5)  6)  7)  8)  9)	
CRITICAL	ITIES
FLIGHT PHASE HDW/FUNC PRELAUNCH: / LIFTOFF: / ONORBIT: 3/1R DEORBIT: / LANDING/SAFING: /	ABORT HDW/FUNC RTLS: / TAL: / AOA: / ATO: /
REDUNDANCY SCREENS: A [ 2 ]	B [ F ] C [ P ]
LOCATION: MIDDECK PART NUMBER: MA.SH.3	
CAUSES: PIECE-PART STRUCTURAL FAIL	URE
EFFECTS/RATIONALE: ATMOSPHERE LEAKAGE THROUGH THE VIEW LIFE.	PORT COULD CAUSE THE LOSS OF
REFERENCES:	

HIGHEST CRITICALITY HDW/FUNC DATE: 7/08/87 SUBSYSTEM: MECH/PH FLIGHT: 3/1R / ABORT: MDAC ID: 7115 ITEM: VIEWPORT FAILURE MODE: CRACKED THE REPORT OF THE PERSON OF TH SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: A.D. MONTGOMERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) PERSONNEL HATCHES 3) SIDE HATCH 4) 5) 6) 7) 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE RTLS: PRELAUNCH: / LIFTOFF: TAL: 3/1R ONORBIT: AOA: 1 ATO: DEORBIT: LANDING/SAFING: / REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ] LOCATION: MIDDECK PART NUMBER: MA.SH.3 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: ATMOSPHERE LEAKAGE THROUGH THE VIEWPORT COULD CAUSE THE LOSS OF LIFE.

NC

DATE: 7/08/87 SUBSYSTEM: MECH/PH MDAC ID: 7117	HIGHEST CRITICALITY HDW/FUNC FLIGHT: 3/3 ABORT: /
ITEM: VIEWPORT LATCH FAILURE MODE: FAILS CLOSED	e e e e e e e e e e e e e e e e e e e
LEAD ANALYST: A.D. MONTGOMERY	SUBSYS LEAD: H.J. LOWERY
BREAKDOWN HIERARCHY:  1) MECHANICAL ACTUATION SYSTEM  2) PERSONNEL HATCHES  3) SIDE HATCH  4)  5)  6)  7)  8)	
CRITICAL	ITIES
FLIGHT PHASE HDW/FUNC	ABORT HDW/FUNC
PRELAUNCH: /	RTLS: /
LIFTOFF: /	TAL:
ONORBIT: 3/3	AOA: /
DEORBIT: /	ATO: /
LANDING/SAFING: /	
REDUNDANCY SCREENS: A [ ]	в[] с[]
LOCATION: MIDDECK PART NUMBER: MA.SH.4	
CAUSES: PIECE-PART STRUCTURAL FAIL	JRE
EFFECTS/RATIONALE: WILL NOT BE ABLE TO UNLATCH THE VIEW	PORT COVER.

HIGHEST CRITICALITY HDW/FUNC DATE: 7/08/87 3/3 FLIGHT: SUBSYSTEM: MECH/PH 3/3 ABORT: 7118 MDAC ID: BOOT ITEM: FAILURE MODE: LEAKAGE SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: A.D. MONTGOMERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM PERSONNEL HATCHES 2) 3) SIDE HATCH ATTENUATOR 4) 5) 6) 7) 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE RTLS: 3/3 3/3 PRELAUNCH: 3/3 TAL: 3/3 LIFTOFF: 3/3 AOA: 3/3 ONORBIT: ATO: 3/3 DEORBIT: 3/3 LANDING/SAFING: 3/3 REDUNDANCY SCREENS: A [ ] B [ ] C [ ] MIDDECK LOCATION: PART NUMBER: MA.SH.AT.1 CAUSES: PIECE-PART STRUCTURAL FAILURE

REFERENCES:

EFFECTS/RATIONALE:

NO EFFECT. THIS FAILURE DOES NOT AFFECT HATCH OPERATION.

HIGHEST CRITICALITY HDW/FUNC 7/08/87 DATE: SUBSYSTEM: MECH/PH FLIGHT: 3/3 ABORT: 3/3 MDAC ID: ~7119 ITEM: DRAIN TUBING FAILURE MODE: LEAKAGE LEAD ANALYST: A.D. MONTGOMERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM PERSONNEL HATCHES 2) 3) SIDE HATCH ATTENUATOR 4) 5) 6) 7) 8) 9) CRITICALITIES HDW/FUNC HDW/FUNC FLIGHT PHASE ABORT 3/3 PRELAUNCH: 3/3 RTLS: 3/3 LIFTOFF: TAL: 3/3 ONORBIT: 3/3 AOA: 3/3 ATO: DEORBIT: 3/3 3/3 LANDING/SAFING: 3/3 B [ ] REDUNDANCY SCREENS: A [ ] C [ LOCATION: MIDDECK PART NUMBER: MA.SH.AT.1 CAUSES: PIECE-PART STRUCTURAL FAILURE EFFECTS/RATIONALE: NO EFFECT. THIS FAILURE DOES NOT AFFECT HATCH OPERATION.

HIGHEST CRITICALITY HDW/FUNC 7/08/87 DATE: 3/3 FLIGHT: SUBSYSTEM: MECH/PH 3/3 ABORT: MDAC ID: 7120 DRAIN TUBING ITEM: FAILURE MODE: CLOGGED SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: A.D. MONTGOMERY BREAKDOWN HIERARCHY: MECHANICAL ACTUATION SYSTEM 2) PERSONNEL HATCHES 3) SIDE HATCH ATTENUATOR 4) 5) 6) 7) 8) 9) CRITTCALITIES

	CIVITION		
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING	: 3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: MIDDECK
PART NUMBER: MA.SH.AT.1

CAUSES: DEBRIS IN DRAIN TUBING

EFFECTS/RATIONALE:

NO EFFECT. THIS FAILURE DOES NOT AFFECT HATCH OPERATION.

C.8

VENT DOOR MECHANISM ANALYSIS WORKSHEETS

# VENT DOOR MECHANISM ANALYSIS WORKSHEETS SUMMARY

	CRITIC	ALITY	REDUNDANCY	
	FLIGHT			
MDAC-ID	H/F	H/F	ABC	ITEM NAME
		<u>-</u>		
8100 *	2/1R	2/1R	PNP	ROD ASSEMBLY
8101 *	2/1R	2/1R	PNP	BELLCRANK
8102 *	2/1R	2/1R	PNP	BOLT/BRACKET/DOUBLER
	2/1R		PNP	INPUT/OUTPUT TORQUE SHAFT
8104 *	2/1R	2/1R	PNP	INPUT/OUTPUT TORQUE SHAFT
8105 *	2/1R	2/1R	PNP	DIFFERENTIAL/GEAR TRAIN ASSY
8106 *	2/1R	2/1R	PNP	DIFFERENTIAL/GEAR TRAIN ASSY
8107 *	2/1R		PNP	MICROSWITCH POSITION INDICATOR
8108 *	2/1R	2/1R	PNP	MICROSWITCH POSITION INDICATOR
8109	3/3	3/3		ALL ITEMS NOT SHOWN ON MDAC ID
8501 *	2/1R		PNP	ACTUATOR MOTOR
8502 *	2/1R	2/1R	PNP	ACTUATOR SWITCH MODULE
8503 *	2/1R	2/1R	PNP	MCA AC POWER RELAY
8504 *	2/1R	2/1R	PNP	MCA PURGE SIGNAL DRIVER
8505 *	2/1R			MCA DC POWER BUS
8506 *	2/1R	2/1R	PNP	MCA AC POWER BUS
8507 *	2/1R	2/1R	PNP	MCA DIODE
8508 *	2/1R	2/1R	PNP	MCA DIODE
8509 *	2/1R	2/1R	PNP	ELECTRICAL CONNECTORS/PINS
8510 *	2/1R			CABLES/WIRING
8511 *	2/1R	2/1R	P N P	MODULATOR/DEMODULATOR
8512 *	2/1R	2/1R	PNP	MODULATOR/DEMODULATOR
8513 *	2/1R	2/1R		GPC SOFTWARE
8514 *	2/1R	2/1R	PNP	FUSE
8515 *	2/1R		PNP	RESISTOR
8516 *	2/1R	2/1R		RESISTOR
8517 *	2/1R	2/1R	PNP	GPC SOFTWARE

^(*) Potential Critical Items.

7/08/87 HIGHEST CRITICALITY HDW/FUNC DATE: FLIGHT: 2/1R SUBSYSTEM: MECH/VDM

ABORT: 2/1R 8100 MDAC ID:

ROD ASSEMBLY ITEM:

FAILURE MODE: PHYSICAL BINDING/JAMMING, LINKAGE INOPERABLE,

DEBRIS OR FROZEN BEARING SURFACE

LEAD ANALYST: H.J. LOWERY SUBSYS LEAD: H.J. LOWERY

### BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- VENT DOOR MECHANISM 2)
- 3) ROD ASSEMBLY
- 4)
- 5)
- 6)
- 7) 8)
- 9)

#### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	2/1R	TAL:	3/3
ONORBIT:	3/3	AOA:	2/1R
DEORBIT:	2/1R	ATO:	2/1R
LANDING/SAFING:	3/3		·

REDUNDANCY SCREENS: A [ 2 ] B [NA ] C [ P ]

LOCATION: NEAR DOOR

PART NUMBER: V070-592511-001/2, 5512-007/8, ME162-0024-001/2,

(TBD)

CAUSES: OVERLOAD, PIECE-PART FAILURE, STRUCTURAL FAILURE

EFFECTS/RATIONALE:

LOSS OF PRESSURE CONTROL DURING TRANSIENT PRESSURE CONDITIONS

BECAUSE OF INABILITY TO CONTROL DOOR POSITION.

DATE: 7/08/87 HIGHEST CRITICALITY HDW/FUNC SUBSYSTEM: MECH/VDM FLIGHT: 2/1R MDAC ID: 8101 ABORT: 2/1R

ITEM: BELLCRANK

FAILURE MODE: PHYSICAL BINDING/JAMMING, LINKAGE INOPERABLE,

BENT, BROKEN, DEBRIS OR FROZEN BEARING SURFACE

LEAD ANALYST: H.J. LOWERY SUBSYS LEAD: H.J. LOWERY

#### BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) VENT DOOR MECHANISM
- 3) BELLCRANK
- 4)
- 5)
- 6)
- 7) 8)
- 9)

#### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	2/1R	TAL:	3/3
ONORBIT:	3/3	AOA:	2/1R
DEORBIT:	2/1R	ATO:	2/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [NA ] C [ P ]

LOCATION: NEAR DOOR

PART NUMBER: V070-594505/6-001, 11/2-001, (TBD)

CAUSES: OVERLOAD, PIECE-PART FAILURE, STRUCTURAL FAILURE

EFFECTS/RATIONALE:

LOSS OF PRESSURE CONTROL DURING TRANSIENT PRESSURE CONDITIONS

BECAUSE OF INABILITY TO CONTROL DOOR POSITION.

DATE:

7/08/87

HIGHEST CRITICALITY HDW/FUNC

MDAC ID:

SUBSYSTEM: MECH/VDM 8102

FLIGHT: ABORT:

2/1R 2/1R

ITEM:

BOLT/BRACKET/DOUBLER

FAILURE MODE: PHYSICAL BINDING/JAMMING, LINKAGE INOPERABLE,

BENT, BROKEN, DEBRIS OR FROZEN BEARING SURFACE

LEAD ANALYST: H.J. LOWERY

SUBSYS LEAD: H.J. LOWERY

#### BREAKDOWN HIERARCHY:

- MECHANICAL ACTUATION SYSTEM 1)
- 2) VENT DOOR MECHANISM
- 3) BOLT/BRACKET/DOUBLER

4)

5)

6)

7)

8) 9)

#### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	2/1R	TAL:	3/3
ONORBIT:	3/3	AOA:	2/1R
DEORBIT:	2/1R	ATO:	2/1R
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [ 2 ] B [NA ] C [ P ]

LOCATION:

NEAR DOOR

PART NUMBER: NAS1004-16/18/22, V070-384318-002,5328-002,595528,

V070-385311/2-001/2, (TBD)

CAUSES: OVERLOAD, PIECE-PART FAILURE, STRUCTURAL FAILURE

#### EFFECTS/RATIONALE:

LOSS OF PRESSURE CONTROL DURING TRANSIENT PRESSURE CONDITIONS

BECAUSE OF INABILITY TO CONTROL DOOR POSITION.

DATE: 7/08/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: MECH/VDM FLIGHT: 2/1R MDAC ID: 8103 ABORT: 2/1R

ITEM: INPUT/OUTPUT TORQUE SHAFT - HOUSING

FAILURE MODE: PHYSICAL BINDING/JAMMING, STRUCTURAL FAILURE

LEAD ANALYST: H.J. LOWERY SUBSYS LEAD: H.J. LOWERY

#### BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) VENT DOOR MECHANISM
- 3) INPUT/OUTPUT TORQUE SHAFT HOUSING
- 4)
- 5)
- 6)
- 7) 8)
- 9)

#### CRITICALITIES

			TIDES (DINIA
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	2/1R	TAL:	3/3
ONORBIT:	3/3	AOA:	2/1R
DEORBIT:	2/1R	ATO:	2/1R
LANDING/SAFING:	3/3		

LANDING/SAFING: 3/3

REDUNDANCY SCREENS: A [ 2 ] B [NA ] C [ P ]

LOCATION: NEAR DOOR

PART NUMBER: MC147-0008/9-004-6, V070-594504/7-001/2, 2503/13-

001/2, (TBD)

CAUSES: CONTAMINATION, MECHANICAL SHOCK, MISHANDLING/ABUSE, OVERLOAD, PIECE-PART FAILURE, STRUCTURAL FAILURE, TEMPERATURE, THERMAL SHOCK, ACCELERATION, VIBRATION

#### EFFECTS/RATIONALE:

LOSS OF PRESSURE CONTROL DURING TRANSIENT PRESSURE CONDITIONS BECAUSE OF INABILITY TO CONTROL DOOR POSITION.

DATE: 7/08/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: MECH/VDM FLIGHT: 2/1R MDAC ID: 8104 ABORT: 2/1R

ITEM: INPUT/OUTPUT TORQUE SHAFT - HOUSING

FAILURE MODE: FAILS TO START/STOP AS COMMANDED AND ROTATES

FREELY

LEAD ANALYST: H.J. LOWERY SUBSYS LEAD: H.J. LOWERY

#### BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) VENT DOOR MECHANISM
- 3) INPUT/OUTPUT TORQUE SHAFT HOUSING

4)

5)

6)

7)

8) 9)

#### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	2/1R	TAL:	3/3
ONORBIT:	3/3	AOA:	2/1R
DEORBIT:	2/1R	ATO:	2/1R
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [ 2 ] B [NA ] C [ P ]

LOCATION: NEAR DOOR

PART NUMBER: MC147-0008/9-004-6, V070-594504/7-001/2, 2503/13-

001/2, (TBD)

CAUSES: CONTAMINATION, MECHANICAL SHOCK, MISHANDLING/ABUSE, OVERLOAD, PIECE-PART FAILURE, STRUCTURAL FAILURE, TEMPERATURE, THERMAL SHOCK, ACCELERATION, VIBRATION

# EFFECTS/RATIONALE:

LOSS OF PRESSURE CONTROL DURING TRANSIENT PRESSURE CONDITIONS BECAUSE OF INABILITY TO CONTROL DOOR POSITION.

DATE: 7/08/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: MECH/VDM FLIGHT: 2/1R MDAC ID: 8105 ABORT: 2/1R

ITEM: DIFFERENTIAL/GEAR TRAIN ASSEMBLY

FAILURE MODE: PHYSICAL BINDING/JAMMING, STRUCTURAL FAILURE

LEAD ANALYST: H.J. LOWERY SUBSYS LEAD: H.J. LOWERY

#### BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) VENT DOOR MECHANISM
- 3) DIFFERENTIAL/GEAR TRAIN ASSEMBLY
- 4)
- 5)
- 6)
- 7) 8)
- 9)

#### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	2/1R	TAL:	3/3
ONORBIT:	3/3	AOA:	2/1R
DEORBIT:	2/1R	ATO:	2/1R
LANDING/SAFING:	•		

REDUNDANCY SCREENS: A [ 2 ] B [NA ] C [ P ]

LOCATION: NEAR DOOR

PART NUMBER: MC147-0008/9-004-6, V070-594504/7-001/2, 2503/13-001/2, (TBD)

CAUSES: CONTAMINATION, PIECE-PART FAILURE, STRUCTURAL FAILURE, JAMMED, FRACTURE

EFFECTS/RATIONALE:

LOSS OF PRESSURE CONTROL DURING TRANSIENT PRESSURE CONDITIONS BECAUSE OF INABILITY TO CONTROL DOOR POSITION.

DATE: 7/08/87 HIGHEST CRITICALITY HDW/FUNC SUBSYSTEM: MECH/VDM FLIGHT: 2/1R

SUBSYSTEM: MECH/VDM FLIGHT: 2/1R MDAC ID: 8106 ABORT: 2/1R

ITEM: DIFFERENTIAL/GEAR TRAIN ASSEMBLY

FAILURE MODE: FAILS TO REMAIN IN POSITION, FREELY ROTATES

LEAD ANALYST: H.J. LOWERY SUBSYS LEAD: H.J. LOWERY

#### BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) VENT DOOR MECHANISM
- 3) DIFFERENTIAL/GEAR TRAIN ASSEMBLY
- 4)
- 5)
- 6)
- 7)
- 8) 9)

#### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	2/1R	TAL:	3/3
ONORBIT:	3/3	AOA:	2/1R
DEORBIT:	2/1R	ATO:	2/1R
LANDING/SAFING:	3/3		·

REDUNDANCY SCREENS: A [ 2 ] B [NA ] C [ P ]

LOCATION: NEAR DOOR

PART NUMBER: MC147-0008/9-004-6, V070-594504/7-001/2, 2503/13-

001/2, (TBD)

CAUSES: MECHANICAL SHOCK, OVERLOAD, PIECE-PART FAILURE,

STRUCTURAL FAILURE, VIBRATION

# EFFECTS/RATIONALE:

LOSS OF PRESSURE CONTROL DURING TRANSIENT PRESSURE CONDITIONS BECAUSE OF INABILITY TO CONTROL DOOR POSITION.

DATE: 7/08/87 HIGHEST CRITICALITY HDW/FUNC SUBSYSTEM: MECH/VDM FLIGHT: 2/1R

SUBSYSTEM: MECH/VDM FLIGHT: 2/1R MDAC ID: 8107 ABORT: 2/1R

ITEM: MICROSWITCH POSITION INDICATOR, ACTUATOR

FAILURE MODE: FAILS TO REMAIN OPEN, FAILS TO OPEN, PREMATURE

OPERATION

LEAD ANALYST: H.J. LOWERY SUBSYS LEAD: H.J. LOWERY

# BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) VENT DOOR MECHANISM
- 3) MICROSWITCH POSITION INDICATOR, ACTUATOR

4)

5)

6)

7)

8) 9)

#### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	2/1R	TAL:	3/3
ONORBIT:	3/3	AOA:	2/1R
DEORBIT:	2/1R	ATO:	2/1R
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [NA ] C [ P ]

LOCATION: NEAR DOOR

PART NUMBER: MC147-0008/9-004-6, (TBD)

CAUSES: CONTAMINATION, PIECE-PART FAILURE, TEMPERATURE, THERMAL

SHOCK, VIBRATION, INADVERTENT OPERATION/ACTIVATION

EFFECTS/RATIONALE:

LOSS OF PRESSURE CONTROL DURING TRANSIENT PRESSURE CONDITIONS BECAUSE OF INABILITY TO CONTROL DOOR POSITION.

DATE: 7/08/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: MECH/VDM FLIGHT: 2/1R MDAC ID: 8108 ABORT: 2/1R

ITEM: MICROSWITCH POSITION INDICATOR, ACTUATOR

FAILURE MODE: FAILS TO REMAIN CLOSED, FAILS TO CLOSE, PREMATURE

OPERATION, OPEN (ELECTRICAL)

LEAD ANALYST: H.J. LOWERY SUBSYS LEAD: H.J. LOWERY

#### BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) VENT DOOR MECHANISM
- 3) MICROSWITCH POSITION INDICATOR, ACTUATOR

4)

5)

6)

7) 8)

9)

#### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	2/1R	TAL:	3/3
ONORBIT:	3/3	AOA:	2/1R
DEORBIT:	2/1R	ATO:	2/1R
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [ 2 ] B [NA ] C [ P ]

LOCATION: NEAR DOOR

PART NUMBER: MC147-0008/9-004-6, (TBD)

CAUSES: CONTAMINATION, PIECE-PART FAILURE, TEMPERATURE, THERMAL

SHOCK, VIBRATION, INADVERTENT OPERATION/ACTIVATION

# EFFECTS/RATIONALE:

LOSS OF PRESSURE CONTROL DURING TRANSIENT PRESSURE CONDITIONS BECAUSE OF INABILITY TO CONTROL DOOR POSITION.

HIGHEST CRITICALITY HDW/FUNC DATE: 7/08/87 3/3 SUBSYSTEM: MECH/VDM FLIGHT: 3/3 ABORT: MDAC ID: 8109 ALL ITEMS NOT SHOWN ON MDAC ID 8100 - 8108 ITEM: FAILURE MODE: ALL FAILURE MODES LEAD ANALYST: H.J. LOWERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM 2) VENT DOOR MECHANISM 3) ALL REMAINING PARTS 4) 5) 6) 7) 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE RTLS: TAL: 3/3 3/3 PRELAUNCH: 3/3 3/3 LIFTOFF: 3/3 AOA: 3/3 ONORBIT: ATO: 3/3 DEORBIT: 3/3 LANDING/SAFING: 3/3 REDUNDANCY SCREENS: A [ ] B[] C[] NEAR DOOR LOCATION: PART NUMBER: ALL PARTS NOT SHOWN ON MDAC ID 8100 - 8108 CAUSES: ALL CAUSES EFFECTS/RATIONALE: FAILURE OF ALL PARTS NOT SHOWN ON MDAC ID 8100 -8108 WILL HAVE NO EFFECT ON MISSION, VEHICLE OR CREW. the control of the co REFERENCES: V070-592501,4501,381031,4031,5031,5300, SSSH DWG. NO. 15.1 SHEET 1-3, (TBD)

DATE:

9/08/87

HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: MECH/VDM/EPD&C

FLIGHT:

2/1R

MDAC ID:

8501

ABORT:

2/1R

ITEM:

ACTUATOR MOTOR

FAILURE MODE: PREMATURE OPERATION, DELAYED OPERATION, OPEN

(ELECTRICAL), SHORTED, FAILS TO START/STOP

LEAD ANALYST: M. BRADWAY SUBSYS LEAD: H.J. LOWERY

#### BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- VENT DOOR MECHANISM
- 3) ELECTROMECHANICAL ACTUATOR
- ACTUATOR MOTOR 4)

5)

6)

7)

8)

9)

#### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	2/1R	RTLS:	3/3
LIFTOFF:	2/1R	TAL:	3/3
ONORBIT:	3/3	AOA:	2/1R
DEORBIT:	2/1R	ATO:	2/1R
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [ 2 ]

B [NA ] C [ P ]

LOCATION:

INSIDE ACTUATOR ASSEMBLY, NEAR VENT DOOR

PART NUMBER: 10V59A(XX)

CAUSES: ERRONEOUS INPUT, MECHANICAL SHOCK, OVERLOAD, PIECE-PART

FAILURE, PARTIAL INPUT, LOSS OF INPUT, VIBRATION

#### EFFECTS/RATIONALE:

LOSS OF PRESSURE CONTROL DURING TRANSIENT PRESSURE CONDITIONS DUE TO INABILITY OF ACTUATOR MOTOR TO MOVE VENT DOOR TO REQUIRED POSITION. EXCESS DELTA P COULD CAUSE ORBITER STRUCTURAL AND PAYLOAD DAMAGE. POTENTIAL FOR EXCESS BUILDUP OF HAZARDOUS GAS (H2) DURING PRELAUNCH DUE TO LOSS OF PURGE SYSTEM CONTROL. COULD CREATE A TOXIC/EXPLOSIVE GAS ENVIRONMENT. INABILITY TO CLOSE VENT DOORS DURING RE-ENTRY CREATES POTENTIAL FOR ORBITER/PAYLOAD DAMAGE DUE TO THERMAL ENVIRONMENT DURING RE-ENTRY.

DATE: 9/08/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: MECH/VDM/EPD&C FLIGHT: 2/1R MDAC ID: 8502 ABORT: 2/1R

ITEM: ACTUATOR SWITCH MODULE

FAILURE MODE: OPEN (ELECTRICAL), LOSS OF OUTPUT, FAILS TO

SWITCH, SHORTED

LEAD ANALYST: M. BRADWAY SUBSYS LEAD: H.J. LOWERY

### BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) VENT DOOR MECHANISM
- 3) ELECTROMECHANICAL ACTUATOR
- 4) ACTUATOR SWITCH MODULE
- 5)
- 6)
- 7)
- 8) 9)

#### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC	
PRELAUNCH:	2/1R	RTLS:	3/3	
LIFTOFF:	2/1R	TAL:	3/3	
ONORBIT:	3/3	AOA:	2/1R	
DEORBIT:	2/1R	ATO:	2/1R	
LANDING/SAFING	,		, ,	

REDUNDANCY SCREENS: A [ 2 ] B [NA ] C [ P ]

LOCATION: INSIDE ACTUATOR ASSEMBLY, NEAR VENT DOOR

PART NUMBER: TBD

CAUSES: ERRONEOUS INPUT, MECHANICAL SHOCK, OVERLOAD, PIECE-PART

FAILURE, PARTIAL INPUT, LOSS OF INPUT, VIBRATION

### EFFECTS/RATIONALE:

LOSS OF PRESSURE CONTROL DURING TRANSIENT PRESSURE CONDITIONS DUE TO INABILITY TO CONTROL VENT DOOR OPERATION. EXCESS DELTA P COULD CAUSE ORBITER STRUCTURAL AND PAYLOAD DAMAGE. POTENTIAL FOR EXCESS BUILDUP OF HAZARDOUS GAS (H2) DURING PRELAUNCH DUE TO LOSS OF PURGE SYSTEM CONTROL. COULD CREATE A TOXIC/EXPLOSIVE GAS ENVIRONMENT. INABILITY TO CLOSE VENT DOORS DURING RE-ENTRY CREATES POTENTIAL FOR ORBITER/PAYLOAD DAMAGE DUE TO THERMAL ENVIRONMENT DURING RE-ENTRY.

SUBSYSTEM: MECH/VDM/EPD&C

MDAC ID: 9500

MDAC ID: 8503

ABORT:

2/1R

ITEM:

MCA AC POWER RELAY

FAILURE MODE: PARTIAL OUTPUT, OPEN (ELECTRICAL), LOSS OF OUTPUT,

FAILS TO SWITCH, SHORTED

SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: M. BRADWAY

### BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) VENT DOOR MECHANISMS
- 3) MOTOR CONTROL ASSEMBLY
- 4) AC POWER RELAY

5)

6)

7)

8)

9)

#### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	2/1R	RTLS:	3/3
LIFTOFF:	2/1R	TAL:	3/3
ONORBIT:	3/3	AOA:	2/1R
DEORBIT:	2/1R	ATO:	2/1R
LANDING/SAFING:	3/3	•	•

REDUNDANCY SCREENS: A [ 2 ] B [NA ] C [ P ]

LOCATION: MOTOR CONTROL ASSEMBLY

PART NUMBER: TBD

CAUSES: MECHANICAL SHOCK, OVERLOAD, PIECE-PART FAILURE, PARTIAL INPUT, LOSS OF INPUT, VIBRATION

EFFECTS/RATIONALE:

LOSS OF PRESSURE CONTROL DURING TRANSIENT PRESSURE CONDITIONS DUE TO INABILITY TO CONTROL VENT DOOR OPERATION. EXCESS DELTA P MAY CAUSE ORBITER STRUCTURAL AND PAYLOAD DAMAGE. POTENTIAL FOR EXCESS BUILDUP OF HAZARDOUS GAS (H2) DURING PRELAUNCH DUE TO LOSS OF PURGE SYSTEM CONTROL. COULD CREATE A

TOXIC/EXPLOSIVE GAS ENVIRONMENT. INABILITY TO CLOSE VENT DOORS DURING RE-ENTRY CREATES POTENTIAL FOR ORBITER/PAYLOAD DAMAGE DUE TO THERMAL ENVIRONMENT DURING RE-ENTRY.

DATE: 9/08/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: MECH/VDM/EPD&C FLIGHT: 2/1R

MDAC ID: 8504 ABORT: 2/1R

ITEM: MCA PURGE SIGNAL DRIVER

FAILURE MODE: ERRONEOUS OUTPUT, OPEN (ELECTRICAL), LOSS OF

OUTPUT, SHORTED

LEAD ANALYST: M. BRADWAY SUBSYS LEAD: H.J. LOWERY

#### BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) VENT DOOR MECHANISMS
- 3) MOTOR CONTROL ASSEMBLY
- 4) PURGE SIGNAL DRIVER
- 5)
- 6)
- 7)
- 8) 9)

#### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	2/1R	RTLS:	3/3
LIFTOFF:	2/1R	TAL:	3/3 -
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	2/1R
LANDING/SAFING	<b>:</b> 3/3		

REDUNDANCY SCREENS: A [ 2 ] B [NA ] C [ P ]

LOCATION: MOTOR CONTROL ASSEMBLY

PART NUMBER: REFERENCE DESIGNATOR - AR(XX)-TYPE 1

CAUSES: MECHANICAL SHOCK, OVERLOAD, PIECE-PART FAILURE, TEMPERATURE, PARTIAL INPUT, ELECTROMAGNETIC FIELDS, LOSS OF INPUT, VIBRATION

#### EFFECTS/RATIONALE:

POTENTIAL FOR EXCESS BUILDUP OF HAZARDOUS GASES (H2) DURING PRELAUNCH DUE TO LOSS OF PURGE SYSTEM CONTROL. COULD CREATE A TOXIC/EXPLOSIVE GAS ENVIRONMENT.

HIGHEST CRITICALITY HDW/FUNC 9/08/87 DATE:

SUBSYSTEM: MECH/VDM/EPD&C FLIGHT: 2/1R 2/1R ABORT: MDAC ID: 8505

MCA DC POWER BUS ITEM:

FAILURE MODE: OPEN (ELECTRICAL), LOSS OF OUTPUT, SHORTED

LEAD ANALYST: M. BRADWAY SUBSYS LEAD: H.J. LOWERY

#### BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- VENT DOOR MECHANISMS 2)
- 3) MOTOR CONTROL ASSEMBLY
- DC POWER BUS 4)
- 5)
- 6)
- 7)
- 8)
- 9)

#### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	2/1R	RTLS:	3/3
LIFTOFF:	2/1R	TAL:	3/3
ONORBIT:	3/3	AOA:	2/1R
DEORBIT:	2/1R	ATO:	2/1R
LANDING/SAFING:	3/3	•	

REDUNDANCY SCREENS: A [ 2 ] B [NA ] C [ P ]

LOCATION: MOTOR CONTROL ASSEMBLY

PART NUMBER: REFERENCE DESIGNATOR - DC-A, B, C

CAUSES: MECHANICAL SHOCK, OVERLOAD, PIECE-PART FAILURE, LOSS OF INPUT, VIBRATION

#### EFFECTS/RATIONALE:

LOSS OF PRESSURE CONTROL DURING TRANSIENT PRESSURE CONDITIONS DUE TO INABILITY TO CONTROL VENT DOOR OPERATION. EXCESS DELTA P COULD CAUSE ORBITER STRUCTURAL AND PAYLOAD DAMAGE. POTENTIAL FOR EXCESS BUILDUP OF HAZARDOUS GAS (H2) DURING PRELAUNCH DUE TO LOSS OF PURGE SYSTEM CONTROL. COULD CREATE A TOXIC/EXPLOSIVE GAS ENVIRONMENT. INABILITY TO CLOSE VENT DOORS DURING RE-ENTRY CREATES POTENTIAL FOR ORBITER/PAYLOAD DAMAGE DUE TO THERMAL ENVIRONMENT DURING RE-ENTRY.

DATE: 9/08/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: MECH/VDM/EPD&C FLIGHT: 2/1R MDAC ID: 8506 ABORT: 2/1R

ITEM: MCA AC POWER BUS

FAILURE MODE: OPEN (ELECTRICAL), LOSS OF OUTPUT, SHORTED

LEAD ANALYST: M. BRADWAY SUBSYS LEAD: H.J. LOWERY

### BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) VENT DOOR MECHANISMS
- 3) MOTOR CONTROL ASSEMBLY
- 4) AC POWER BUS (3-PHASE)
- 5)
- 6)
- 7)
- 8)
- 9)

#### CRITICALITIES

V1/2 2 2 V11-2			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	2/1R	RTLS:	3/3
LIFTOFF:	2/1R	TAL:	3/3
ONORBIT:	3/3	AOA:	2/1R
DEORBIT:	2/1R	ATO:	2/1R
LANDING/SAFING	: 3/3		

REDUNDANCY SCREENS: A [ 2 ] B [NA ] C [ P ]

LOCATION: MOTOR CONTROL ASSEMBLY

PART NUMBER: REFERENCE DESIGNATOR - AC-1, AC-2, AC-3

CAUSES: MECHANICAL SHOCK, OVERLOAD, PIECE-PART FAILURE, PARTIAL INPUT, LOSS OF INPUT, VIBRATION

# EFFECTS/RATIONALE:

LOSS OF PRESSURE CONTROL DURING TRANSIENT PRESSURE CONDITIONS DUE TO INABILITY TO CONTROL VENT DOOR OPERATION. EXCESS DELTA P COULD CAUSE ORBITER STRUCTURAL AND PAYLOAD DAMAGE. POTENTIAL FOR EXCESS BUILDUP OF HAZARDOUS GAS (H2) DURING PRELAUNCH DUE TO LOSS OF PURGE SYSTEM CONTROL. COULD CREATE A TOXIC/EXPLOSIVE GAS ENVIRONMENT. INABILITY TO CLOSE VENT DOORS DURING RE-ENTRY CREATES POTENTIAL FOR ORBITER/PAYLOAD DAMAGE DUE TO THERMAL ENVIRONMENT DURING RE-ENTRY.

9/08/87 HIGHEST CRITICALITY HDW/FUNC DATE:

SUBSYSTEM: MECH/VDM/EPD&C FLIGHT: 2/1R

ABORT: 2/1R MDAC ID: 8507

MCA DIODE ITEM:

FAILURE MODE: OPEN (ELECTRICAL)

LEAD ANALYST: M. BRADWAY SUBSYS LEAD: H.J. LOWERY

#### BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) VENT DOOR MECHANISMS
- 3) MOTOR CONTROL ASSEMBLY
- 4) DIODE

5)

6)

7) 8)

9)

#### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	2/1R	TAL:	3/3
ONORBIT:	3/3	AOA:	2/1R
DEORBIT:	2/1R	ATO:	2/1R
LANDING/SAFIN	G: 3/3		

REDUNDANCY SCREENS: A [ 2 ] B [NA ] C [ P ]

LOCATION: MOTOR CONTROL ASSEMBLY

PART NUMBER: REFERENCE DESIGNATOR - A1CR(XX)

CAUSES: OVERLOAD, PIECE-PART FAILURE, TEMPERATURE, THERMAL SHOCK

#### EFFECTS/RATIONALE:

INABILITY TO CLOSE VENT DOOR DUE TO LOSS OF "CLOSE" COMMAND SIGNAL TO ACTUATOR MOTOR RELAY LOGIC GATE. LOSS OF PRESSURE/ACOUSTICS CONTROL DUE TO INABILITY TO CLOSE VENT DOORS. EXCESS DELTA P COULD CAUSE ORBITER STRUCTURAL AND PAYLOAD DAMAGE. POTENTIAL FOR ACOUSTIC DAMAGE TO PAYLOADS. POTENTIAL FOR ORBITER/PAYLOAD DAMAGE DUE TO THERMAL ENVIRONMENT DURING RE-ENTRY.

HIGHEST CRITICALITY HDW/FUNC 9/08/87

FLIGHT: 2/1R SUBSYSTEM: MECH/VDM/EPD&C

2/1R ABORT: MDAC ID: 8508

MCA DIODE ITEM: FAILURE MODE: SHORTED

LEAD ANALYST: M. BRADWAY SUBSYS LEAD: H.J. LOWERY

# BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- VENT DOOR MECHANISMS
- 3) MOTOR CONTROL ASSEMBLY
- DIODE 4)
- 5)
- 6)
- 7)
- 8) 9)

#### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	2/1R	RTLS:	3/3
LIFTOFF:	2/1R	TAL:	3/3
ONORBIT:	3/3	AOA:	2/1R
DEORBIT:	2/1R	ATO:	2/1R
LANDING/SAFING:	•		

REDUNDANCY SCREENS: A [ 2 ] B [NA ] C [ P ]

MOTOR CONTROL ASSEMBLY LOCATION:

PART NUMBER: REFERENCE DESIGNATOR - A1CR(XX)

### **CAUSES:**

#### EFFECTS/RATIONALE:

A SHORTED DIODE COULD CAUSE DAMAGE TO MDM "CLOSE" COMMAND OUTPUT CIRCUITRY AND SHORT "PURGE" COMMAND SIGNAL, CAUSING LOSS OF MCA RELAY CONTROL DURING CLOSE OR PURGE CYCLES. POTENTIAL FOR EXCESS BUILDUP OF HAZARDOUS GASES (H2) DURING PRELAUNCH DUE TO LOSS OF PURGE SYSTEM CONTROL. COULD CREATE A TOXIC/EXPLOSIVE GAS ENVIRONMENT. POTENTIAL FOR ORBITER/PAYLOAD DAMAGE DUE TO THERMAL ENVIRONMENT DURING RE-ENTRY.

DATE:

9/08/87

HIGHEST CRITICALITY HDW/FUNC

MDAC ID: 8509

SUBSYSTEM: MECH/VDM/EPD&C

FLIGHT: 2/1R ABORT: 2/1R

ITEM:

ELECTRICAL CONNECTORS/PINS

FAILURE MODE: OPEN (ELECTRICAL), SHORTED

LEAD ANALYST: M. BRADWAY SUBSYS LEAD: H.J. LOWERY

#### BREAKDOWN HIERARCHY:

1) MECHANICAL ACTUATION SYSTEM

VENT DOOR MECHANISM

3) ELECTRICAL CONNECTORS/PINS

4)

5)

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	2/1R	RTLS:	3/3
LIFTOFF:	2/1R	TAL:	3/3
ONORBIT:	3/3	AOA:	2/1R
DEORBIT:	2/1R	ATO:	2/1R
LANDING/SAFING:	3/3	<u> </u>	

REDUNDANCY SCREENS: A [ 2 ] B [NA ] C [ P ]

LOCATION: FROM MDMs TO VENT DOOR ACTUATOR MOTORS

PART NUMBER: TBD

CAUSES: MECHANICAL SHOCK, PIECE-PART FAILURE, TEMPERATURE,

THERMAL SHOCK, VIBRATION

#### EFFECTS/RATIONALE:

LOSS OF PRESSURE CONTROL DURING TRANSIENT PRESSURE CONDITIONS DUE TO INABILITY TO CONTROL VENT DOOR OPERATION. EXCESS DELTA P MAY CAUSE ORBITER STRUCTURAL AND PAYLOAD DAMAGE. POTENTIAL FOR EXCESS BUILDUP OF HAZARDOUS GAS (H2) DURING PRELAUNCH DUE TO LOSS OF PURGE SYSTEM CONTROL. COULD CREATE A TOXIC/EXPLOSIVE GAS ENVIRONMENT. INABILITY TO CLOSE VENT DOORS DURING RE-ENTRY CREATES POTENTIAL FOR ORBITER/PAYLOAD DAMAGE DUE TO THERMAL ENVIRONMENT DURING RE-ENTRY.

HIGHEST CRITICALITY HDW/FUNC 9/08/87

2/1R SUBSYSTEM: MECH/VDM/EPD&C FLIGHT: 2/1R ABORT: 8510 MDAC ID:

CABLES/WIRING ITEM:

FAILURE MODE: OPEN (ELECTRICAL), SHORTED

LEAD ANALYST: M. BRADWAY SUBSYS LEAD: H.J. LOWERY

### BREAKDOWN HIERARCHY:

- MECHANICAL ACTUATION SYSTEM 1)
- VENT DOOR MECHANISM 2)
- 3) CABLES/WIRING
- 4)
- 5)
- 6)
- 7)
- 8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	2/1R	RTLS:	3/3
LIFTOFF:	2/1R	ŤAL:	3/3
ONORBIT:	3/3	AOA:	2/1R
DEORBIT:	2/1R	ATO:	2/1R
LANDING/SAFING:			

B [NA ] C [ P ] REDUNDANCY SCREENS: A [ 2 ]

FROM MDMs TO VENT DOOR ACTUATOR MOTORS LOCATION:

PART NUMBER: TBD

CAUSES: MECHANICAL SHOCK, OVERLOAD, PIECE-PART FAILURE, TEMPERATURE, THERMAL SHOCK, ELECTROMAGNETIC FIELDS, VIBRATION

#### EFFECTS/RATIONALE:

LOSS OF PRESSURE CONTROL DURING TRANSIENT PRESSURE CONDITIONS DUE TO INABILITY TO CONTROL VENT DOOR OPERATION. EXCESS DELTA P MAY CAUSE ORBITER STRUCTURAL AND PAYLOAD DAMAGE. POTENTIAL FOR EXCESS BUILDUP OF HAZARDOUS GAS (H2) DURING PRELAUNCH DUE TO LOSS OF PURGE SYSTEM CONTROL. COULD CREATE A TOXIC/EXPLOSIVE GAS ENVIRONMENT. INABILITY TO CLOSE VENT DOORS DURING RE-ENTRY CREATES POTENTIAL FOR ORBITER/PAYLOAD DAMAGE DUE TO THERMAL ENVIRONMENT DURING RE-ENTRY.

DATE:

9/08/87

HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: MECH/VDM/EPD&C

FLIGHT:

2/1R

MDAC ID:

ABORT:

2/1R

ITEM:

MODULATOR/DEMODULATOR (2)

FAILURE MODE: DELAYED OPERATION, PARTIAL OUTPUT, LOSS OF OUTPUT

LEAD ANALYST: M. BRADWAY

SUBSYS LEAD: H.J. LOWERY

#### BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- VENT DOOR MECHANISM
- 3) MODULATOR/DEMODULATOR

4)

5)

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	2/1R	RTLS:	3/3
LIFTOFF:	2/1R	TAL:	3/3
ONORBIT:	3/3	AOA:	2/1R
DEORBIT:	2/1R	ATO:	2/1R
LANDING/SAFING	: 3/3		

REDUNDANCY SCREENS: A [ 2 ] B [NA ] C [ P ]

LOCATION: DATA PROCESSING SYSTEM

PART NUMBER: MC615-0004-5100, MC615-0004-5200

CAUSES: ERRONEOUS INPUT, OVERLOAD, PIECE-PART FAILURE,

TEMPERATURE, THERMAL SHOCK, VIBRATION

#### EFFECTS/RATIONALE:

LOSS OF PRESSURE CONTROL DURING TRANSIENT PRESSURE CONDITIONS DUE TO INABILITY TO CONTROL VENT DOOR OPERATION. EXCESS DELTA P MAY CAUSE ORBITER STRUCTURAL AND PAYLOAD DAMAGE. POTENTIAL FOR EXCESS BUILDUP OF HAZARDOUS GAS (H2) DURING PRELAUNCH DUE TO LOSS OF PURGE SYSTEM CONTROL. COULD CREATE A TOXIC/EXPLOSIVE GAS ENVIRONMENT. INABILITY TO CLOSE VENT DOORS DURING RE-ENTRY CREATES POTENTIAL FOR ORBITER/PAYLOAD DAMAGE DUE TO THERMAL ENVIRONMENT DURING RE-ENTRY.

DATE: 9/08/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: MECH/VDM/EPD&C FLIGHT: 2/1R MDAC ID: 8512 ABORT: 2/1R

ITEM: MODULATOR/DEMODULATOR

FAILURE MODE: INADVERTENT OPERATION, PREMATURE OPERATION

LEAD ANALYST: M. BRADWAY SUBSYS LEAD: H.J. LOWERY

# BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) VENT DOOR MECHANISM
- 3) MODULATOR/DEMODULATOR

4)

5)

6)

7)

8)

9)

#### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	2/1R	RTLS:	3/3
LIFTOFF:	2/1R	TAL:	3/3
ONORBIT:	3/3	AOA:	2/1R
DEORBIT:	2/1R	ATO:	2/1R
LANDING/SAFING	: 3/3		

REDUNDANCY SCREENS: A [ 2 ] B [NA ] C [ P ]

LOCATION: DATA PROCESSING SYSTEM

PART NUMBER: MC615-0004-5100, MC615-0004-5200

CAUSES: ERRONEOUS INPUT, PIECE-PART FAILURE, ELECTROMAGNETIC

FIELDS, INADVERTENT OPERATION/ACTIVATION, PARTIAL INPUT

# EFFECTS/RATIONALE:

POTENTIAL FOR EXCESS BUILDUP OF HAZARDOUS GAS (H2) DUE TO PREMATURE VENT OPENING DURING PRELAUNCH. COULD CAUSE TOXIC/EXPLOSIVE GAS ENVIRONMENT. INADVERTENT OPENING OF VENT DOORS DURING RE-ENTRY CREATES POTENTIAL FOR ORBITER/PAYLOAD DAMAGE DUE TO THERMAL ENVIRONMENT DURING RE-ENTRY.

DATE:

9/08/87

HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: MECH/VDM/EPD&C

FLIGHT:

2/1R

MDAC ID:

8513

ABORT:

2/1R

ITEM:

GPC SOFTWARE

FAILURE MODE: INADVERTENT OPERATION, PREMATURE OPERATION

LEAD ANALYST: M. BRADWAY

SUBSYS LEAD: H.J. LOWERY

#### BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- VENT DOOR MECHANISM 2)
- GENERAL PURPOSE COMPUTER
- VENT DOOR CONTROL SOFTWARE 4)

5)

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	2/1R	RTLS:	3/3
LIFTOFF:	2/1R	TAL:	3/3
ONORBIT:	3/3	AOA:	2/1R
DEORBIT:	2/1R	ATO:	2/1R
TANDING /CAPING	•		•

LANDING/SAFING: 3/3

REDUNDANCY SCREENS: A [ 2 ] B [NA ] C [ P ]

LOCATION:

GPCS - DATA PROCESSING SYSTEM

PART NUMBER: N/A

CAUSES: ERRONEOUS INPUT, PARTIAL INPUT, INADVERTENT

OPERATION/ACTIVATION, ELECTROMAGNETIC FIELDS

#### EFFECTS/RATIONALE:

POTENTIAL FOR EXCESS BUILDUP OF HAZARDOUS GAS (H2) DURING PRELAUNCH DUE TO LOSS OF PURGE SYSTEM CONTROL. COULD CREATE AN EXPLOSIVE/TOXIC GAS ENVIRONMENT. INADVERTENT OPENING OF VENT DORRS DURING RE-ENTRY CREATES POTENTIAL FOR ORBITER/PAYLOAD DAMAGE DUE TO THERMAL ENVIRONMENT DURING RE-ENTRY.

HIGHEST CRITICALITY HDW/FUNC 9/08/87

2/1R FLIGHT: SUBSYSTEM: MECH/VDM/EPD&C 2/1R ABORT:

MDAC ID: 8514

**FUSE** ITEM:

FAILURE MODE: OPEN (ELECTRICAL)

SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: M. BRADWAY

# BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- VENT DOOR MECHANISM 2)
- MOTOR CONTROL ASSEMBLY 3)
- FUSE 4)
- 5)
- 6)
- 7)
- 8)
- 9)

#### CRITICALITIES

HDW/FUNC	ABORT	HDW/FUNC
2/1R	RTLS:	3/3
•	TAL:	3/3
3/3	AOA:	2/1R
2/1R	ATO:	2/1R
3/3		
	HDW/FUNC 2/1R 2/1R 3/3 2/1R	HDW/FUNC ABORT 2/1R RTLS: 2/1R TAL: 3/3 AOA: 2/1R ATO:

REDUNDANCY SCREENS: A [ 2 ] B [NA ] C [ P ]

MOTOR CONTROL ASSEMBLY LOCATION:

PART NUMBER: REFERENCE DESIGNATORS - F1, F5

CAUSES: OVERLOAD, PIECE-PART FAILURE, TEMPERATURE, THERMAL SHOCK

### EFFECTS/RATIONALE:

AN OPEN FUSE WOULD CAUSE LOSS OF MCA RELAY CONTROL, CAUSING LOSS OF PRESSURE CONTROL DURING TRANSIENT PRESSURE CONDITIONS DUE TO INABILITY TO CONTROL VENT DOOR OPERATION. EXCESS DELTA P COULD CAUSE ORBITER STRUCTURAL AND PAYLOAD DAMAGE. POTENTIAL FOR HAZARODUS GAS (H2) BUILDUP DURING PRELAUNCH DUE TO LOSS OF PURGE SYSTEM CONTROL. COULD CAUSE TOXIC/EXPLOSIVE GAS ENVIRONMENT. INABILITY TO CLOSE VENT DOORS DURING RE-ENTRY CREATES POTENTIAL FOR ORBITER/PAYLOAD DAMAGE DUE TO THERMAL ENVIRONMENT DURING RE-ENTRY.

DATE:

9/08/87

HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: MECH/VDM/EPD&C

FLIGHT: 2/1R

MDAC ID: 8515

ABORT:

2/1R

ITEM:

RESISTOR

FAILURE MODE: SHORTED

LEAD ANALYST: M. BRADWAY

SUBSYS LEAD: H.J. LOWERY

#### BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- VENT DOOR MECHANISM
- 3) MOTOR CONTROL ASSEMBLY
- 4) RESISTOR

5)

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	2/1R	RTLS:	3/3
LIFTOFF:	2/1R	TAL:	3/3
ONORBIT:	3/3	AOA:	2/1R
DEORBIT:	2/1R	ATO:	2/1R
LANDING/SAFING	: 3/3	Falsy of the State	er e

REDUNDANCY SCREENS: A [ 2 ]

B [NA ] C [ P ]

LOCATION: MOTOR CONTROL ASSEMBLY

PART NUMBER: REFERENCE DESIGNATORS - A1R(X)

CAUSES: OVERLOAD, PIECE-PART FAILURE, TEMPERATURE, THERMAL SHOCK

#### EFFECTS/RATIONALE:

A SHORTED RESISTOR COULD CAUSE DAMAGE TO MDM DOOR POSITION MONITOR CIRCUITRY AND/OR MCA RELAY LOGIC CIRCUITRY, CAUSING LOSS OF PRESSURE CONTROL DURING TRANSIENT PRESSURE CONDITIONS DUE TO INABILITY TO CONTROL VENT DOOR OPERATION. EXCESS DELTA P COULD CAUSE ORBITER STRUCTURAL AND PAYLOAD DAMAGE. POTENTIAL FOR EXCESS BUILDUP OF HAZARDOUS GAS (H2) DUE TO LOSS OF PURGE SYSTEM CONTROL. COULD CAUSE TOXIC/EXPLOSIVE GAS ENVIRONMENT. INABILITY TO CLOSE VENT DOORS DURING RE-ENTRY CREATES POTENTIAL FOR ORBITER/PAYLOAD DAMAGE DUE TO THERMAL ENVIRONMENT DURING RE-ENTRY.

DATE: 9/08/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: MECH/VDM/EPD&C FLIGHT: 2/1R MDAC ID: 8516 ABORT: 2/1R

ITEM: RESISTOR

FAILURE MODE: OPEN (ELECTRICAL)

LEAD ANALYST: M. BRADWAY SUBSYS LEAD: H.J. LOWERY

#### BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) VENT DOOR MECHANISM
- 3) MOTOR CONTROL ASSEMBLY
- 4) RESISTOR
- 5)
- 6)
- 7)
- 8)
- 9)

#### CRITICALITIES

C1/T T T C1:DT T T T T			
FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	2/1R	RTLS:	3/3
LIFTOFF:	2/1R	TAL:	3/3
ONORBIT:	3/3	AOA:	2/1R
DEORBIT:	2/1R	ATO:	2/1R
LANDING/SAFING:	: 3/3		

REDUNDANCY SCREENS: A [ 2 ] B [NA ] C [ P ]

LOCATION: MOTOR CONTROL ASSEMBLY

PART NUMBER: REFERENCE DESIGNATORS - A1R(X)

CAUSES: OVERLOAD, PIECE-PART FAILURE, TEMPERATURE, THERMAL SHOCK

#### EFFECTS/RATIONALE:

AN OPEN RESISTOR WOULD CAUSE LOSS OF ANY ACTUATOR MOTOR MICROSWITCH POSITION FEEDBACK SIGNAL TO MDMs AND MCA RELAY LOGIC CIRCUIT, CAUSING LOSS OF PRESSURE CONTROL DURING TRANSIENT PRESSURE CONDITIONS, DUE TO INABILITY TO CONTROL VENT DOOR OPERATION. EXCESS DELTA P COULD CAUSE ORBITER STRUCTURAL AND PAYLOAD DAMAGE. POTENTIAL FOR EXCESS BUILDUP OF HAZARDOUS GAS (H2) DURING PRELAUNCH DUE TO LOSS OF PURGE SYSTEM CONTROL. COULD CAUSE TOXIC/EXPLOSIVE GAS ENVIRONMENT. INABILITY TO CLOSE VENT DOORS DURING RE-ENTRY CREATES POTENTIAL FOR ORBITER/PAYLOAD DAMAGE DUE TO THERMAL ENVIRONMENT DURING RE-ENTRY.

REFERENCES: VS70-590509, JSC 18341 VOL. II REV. A SB 2.2, JSC 12770 VOL. 10B

DATE: 9/08/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: MECH/VDM/EPD&C

2/1R FLIGHT:

MDAC ID:

8517

ABORT:

2/1R

ITEM:

GPC SOFTWARE

FAILURE MODE: DELAYED OPERATION, ERRONEOUS OUTPUT, LOSS OF

OUTPUT

LEAD ANALYST: M. BRADWAY SUBSYS LEAD: H.J. LOWERY

#### **BREAKDOWN HIERARCHY:**

- MECHANICAL ACTUATION SYSTEM 1)
- VENT DOOR MECHANISM
- GENERAL PURPOSE COMPUTER 3)
- VENT DOOR CONTROL SOFTWARE 4)

5)

6)

7)

8)

9)

#### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	2/1R	RTLS:	3/3
LIFTOFF:	2/1R	TAL:	3/3
ONORBIT:	3/3	AOA:	2/1R
DEORBIT:	2/1R	ATO:	2/1R
LANDING/SAFING:	3/3		•

REDUNDANCY SCREENS: A [ 2 ] B [NA ] C [ P ]

LOCATION:

GPCS - DATA PROCESSING SYSTEM

PART NUMBER: N/A

CAUSES: LOSS OF INPUT, ERRONEOUS INPUT, PARTIAL INPUT, PIECE-

PART FAILURE

#### EFFECTS/RATIONALE:

POTENTIAL FOR EXCESS BUILDUP OF HAZARDOUS GAS (H2) DURING PRELAUNCH DUE TO LOSS OF PURGE SYSTEM CONTROL. COULD CREATE AN EXPLOSIVE/TOXIC GAS ENVIRONMENT. LOSS OF PRESSURE CONTROL DURING TRANSIENT PRESSURE CONDITIONS, DUE TO INABILITY TO CONTROL VENT DOOR OPERATION. EXCESS DELTA P COULD CAUSE ORBITER STRUCTURAL AND PAYLOAD DAMAGE. INABILITY TO CLOSE VENT DOORS DURING RE-ENTRY CREATES POTENTIAL FOR ORBITER/PAYLOAD DAMAGE DUE TO THERMAL ENVIRONMENT DURING RE-ENTRY.

REFERENCES: JSC 18341 VOL. II REV. A SB 2.2, JSC 12770 VOL. 10B

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STARTRACKER DOOR ANALYSIS WORKSHEETS

#### STARTRACKER DOOR ANALYSIS WORKSHEETS SUMMARY

	CRITIC	ALITY	REDUNDANCY	
	FLIGHT	ABORT	SCREENS	
MDAC-ID	H/F	H/F	ABC	ITEM NAME
9100	3/1R	3/3	PPP	INPUT/OUTPUT SHAFT - HOUSING
9101	3/1R	3/3	PPP	INPUT/OUTPUT SHAFT - HOUSING
9102	3/1R	3/3	PPP	OPEN LIMIT SWITCHES (S1 & S3)
9103	3/3	3/3		STOW LIMIT SWITCHES (S1 & S3)
9104	3/3	3/3		DEPLOY LIMIT SWITCHES (S2 & S4)
9105	3/3	3/3		DEPLOY LIMIT SWITCHES (S2 & S4)
9106	3/1R	3/3	PPP	GEAR TRAIN ASSEMBLY
9107	3/1R	3/3	PPP	GEAR TRAIN ASSEMBLY
9108	3/3	3/3		ALL ITEMS NOT SHOWN ON MDAC ID
9500	3/1R	3/3	PPP	CIRCUIT BREAKER/SWITCH
9501	3/3	3/3		ALL ITEMS NOT SHOWN ON MDAC ID

^(*) Potential Critical Items.

DATE: 7/22/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: MECH/SDM FLIGHT: 3/1R MDAC ID: 9100 ABORT: 3/3

ITEM: INPUT/OUTPUT SHAFT - HOUSING

FAILURE MODE: PHYSICAL BINDING/JAMMING, STRUCTURAL FAILURE

(RUPTURE)

LEAD ANALYST: H.J. LOWERY SUBSYS LEAD: H.J. LOWERY

#### BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) STARTRACKER DOOR MECHANISM
- 3) INPUT/OUTPUT SHAFT-HOUSING

4)

5)

6)

7)

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9)

#### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3	·	

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION:

STARTRACKER COMPARTMENT

PART NUMBER:

CAUSES: CONTAMINATION, MECHANICAL SHOCK, MISHANDLING/ABUSE, OVERLOAD, PIECE-PART FAILURE, STRUCTURAL FAILURE, TEMPERATURE, THERMAL SHOCK, ACCELERATION, VIBRATION

#### EFFECTS/RATIONALE:

UNABLE TO OPEN/CLOSE THE Y/Z STARTRACKER DOOR. OPEN - POSSIBLE LOCALIZED COMPARTMENT DAMAGE. CLOSED - LOSS OF Y/Z STARTRACKER.

DATE: 7/22/87 HIGHEST CRITICALITY HDW/FUNC SUBSYSTEM: MECH/SDM FLIGHT: 3/1R

MDAC ID: 9101 ABORT: 3/3

ITEM: INPUT/OUTPUT SHAFT - HOUSING

FAILURE MODE: FAILS TO START/STOP AS COMMANDED AND ROTATES

FREELY

LEAD ANALYST: H.J. LOWERY SUBSYS LEAD: H.J. LOWERY

#### BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) STARTRACKER DOOR MECHANISM
- 3) INPUT/OUTPUT SHAFT-HOUSING
- 4)
- 5)
- 6)
- 7)
- 9)

#### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		·

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: STARTRACKER COMPARTMENT

PART NUMBER: TBD

CAUSES: CONTAMINATION, MECHANICAL SHOCK, MISHANDLING/ABUSE, OVERLOAD, PIECE-PART FAILURE, STRUCTURAL FAILURE, TEMPERATURE, THERMAL SHOCK, ACCELERATION, VIBRATION

#### EFFECTS/RATIONALE:

UNABLE TO OPEN/CLOSE THE Y/Z STARTRACKER DOOR. OPEN - POSSIBLE LOCALIZED COMPARTMENT DAMAGE. CLOSED - LOSS OF Y/Z STARTRACKER.

DATE: 7/22/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: MECH/SDM FLIGHT: 3/1R MDAC ID: 9102 ABORT: 3/3

ITEM: OPEN LIMIT SWITCHES (S1 & 3) ACTUATOR

FAILURE MODE: FAILS TO REMAIN OPEN, FAILS TO OPEN, PREMATURE

OPERATION, SHORTED

LEAD ANALYST: H.J. LOWERY SUBSYS LEAD: H.J. LOWERY

#### BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) STARTRACKER DOOR MECHANISM
- 3) OPEN LIMIT SWITCHES (S1 & 3) ACTUATOR

4)

5)

6)

7)

8) 9)

#### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		-

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: STARTRACKER COMPARTMENT

PART NUMBER: S1 & 3; VS70-590202

CAUSES: ACOUSTICS, CONTAMINATION, PIECE-PART FAILURE, TEMPERATURE, ACCELERATION, VIBRATION, INADVERTENT

OPERATION/ACTIVATION

#### EFFECTS/RATIONALE:

SWITCH INDICATES DOOR IS OPEN WHEN IT MAY BE CLOSED. IF THE DOOR IS CLOSED, OPEN CAPABILITY WOULD BE INHIBITED.

HIGHEST CRITICALITY HDW/FUNC 7/22/87 DATE: SUBSYSTEM: MECH/SDM FLIGHT: 3/3 3/3 ABORT: MDAC ID: 9103 STOW LIMIT SWITCHES (S1 & 3) ACTUATOR ITEM: FAILURE MODE: FAILS TO REMAIN CLOSED, FAILS TO CLOSE, PREMATURE OPERATION, OPEN (ELECTRICAL) SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM STARTRACKER DOOR MECHANISM 3) OPEN LIMIT SWITCHES (S1 & 3) ACTUATOR 4) 5) 6) 7) 8) 9) CRITICALITIES HDW/FUNC ABORT HDW/FUNC FLIGHT PHASE RTLS: PRELAUNCH: 3/3 3/3 3/3 3/3 TAL: LIFTOFF: 3/3 AOA: 3/3 ONORBIT: ATO: 3/3 DEORBIT: 3/3 LANDING/SAFING: 3/3 B[] C[] REDUNDANCY SCREENS: A [ ] LOCATION: STARTRACKER COMPARTMENT PART NUMBER: S1 & 3; VS70-590202 CAUSES: ACOUSTICS, CONTAMINATION, PIECE-PART FAILURE, TEMPERATURE, THERMAL SHOCK, VIBRATION, INADVERTENT OPERATION/ACTIVATION EFFECTS/RATIONALE: SWITCH INDICATES DOOR NOT OPEN WHEN IT MAY BE PROPERLY POSITIONED. MOTORS WOULD CONTINUE TO TURN UNTIL OFF COMMAND IS TRANSMITTED. REFERENCES: V070-310730/1, -591402/3, SSSH DWG. NO. 9.6, VS70-590202/9, -760709, MC452-0123, MC621-0066

DATE: 7/22/87 HIGHEST CRITICALITY HDW/FUNC SUBSYSTEM: MECH/SDM FLIGHT: 3/3 MDAC ID: 9104 ABORT: 3/3

ITEM: DEPLOY LIMIT SWITCHES (S2 & 4)

FAILURE MODE: FAILS TO REMAIN OPEN, FAILS TO OPEN, PREMATURE

OPERATION, SHORTED

LEAD ANALYST: H.J. LOWERY SUBSYS LEAD: H.J. LOWERY

#### BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) STARTRACKER DOOR MECHANISM
- 3) CLOSE LIMIT SWITCHES (S2 & 4) ACTUATOR

4)

5)

6)

7)

8) 9)

#### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		-

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: STARTRACKER COMPARTMENT PART NUMBER: S2 & 4; VS70-590202

CAUSES: ACOUSTICS, CONTAMINATION, PIECE-PART FAILURE, TEMPERATURE, THERMAL SHOCK, VIBRATION, INADVERTENT OPERATION/ACTIVATION

#### EFFECTS/RATIONALE:

SWITCH INDICATES DOOR IS CLOSED WHEN IT MAY BE OPEN. IF THE DOOR IS OPEN, CLOSE CAPABILITY WOULD BE INHIBITED.

HIGHEST CRITICALITY HDW/FUNC 7/22/87 DATE: 3/3 FLIGHT: SUBSYSTEM: MECH/SDM ABORT: 3/3_ MDAC ID: 9105 DEPLOY LIMIT SWITCHES (S2 & 4) ITEM: FAILURE MODE: FAILS TO REMAIN CLOSED, FAILS TO CLOSE, PREMATURE OPERATION, OPEN (ELECTRICAL) LEAD ANALYST: H.J. LOWERY SUBSYS LEAD: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM STARTRACKER DOOR MECHANISM 2) CLOSE LIMIT SWITCHES (S2 & 4) ACTUATOR 4) 5) 6) 7) 8) 9) CRITICALITIES HDW/FUNC FLIGHT PHASE HDW/FUNC ABORT 3/3 PRELAUNCH: 3/3 RTLS: 3/3 LIFTOFF: 3/3 TAL: 3/3 AOA: 3/3 ONORBIT: 3/3 ATO: 3/3 DEORBIT: LANDING/SAFING: 3/3 REDUNDANCY SCREENS: A [ ] B [ ] C [ ] STARTRACKER COMPARTMENT LOCATION: PART NUMBER: S2 & 4; VS70-590202 CAUSES: ACOUSTICS, CONTAMINATION, PIECE-PART FAILURE, TEMPERATURE, THERMAL SHOCK, VIBRATION, INADVERTENT OPERATION/ACTIVATION EFFECTS/RATIONALE: SWITCH INDICATES DOOR NOT CLOSED WHEN IT MAY BE CLOSED. MOTORS WOULD CONTINUE TO TURN UNTIL OFF COMMAND IS TRANSMITTED. REFERENCES: V070-310730/1, -591402/3, SSSH DWG. NO. 9.6, VS70-590202/9, -760709, MC452-0123, MC621-0066

DATE: 7/22/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: MECH/SDM FLIGHT: 3/1R MDAC ID: 9106 ABORT: 3/3

ITEM: GEAR TRAIN ASSEMBLY

FAILURE MODE: PHYSICAL BINDING/JAMMING, STRUCTURAL FAILURE,

FRACTURE

LEAD ANALYST: H.J. LOWERY SUBSYS LEAD: H.J. LOWERY

#### BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) STARTRACKER DOOR MECHANISM
- 3) GEAR TRAIN ASSEMBLY

4)

5)

6)

7)

8) 9)

#### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		,

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: STARTRACKER COMPARTMENT

PART NUMBER: TBD

CAUSES: CONTAMINATION, PIECE-PART FAILURE, STRUCTURAL FAILURE,

JAMMED, FRACTURE

EFFECTS/RATIONALE:

UNABLE TO OPEN/CLOSE STARTRACKER DOOR.

7/22/87 DATE:

HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: MECH/SDM MDAC ID: 9107

FLIGHT: ABORT:

3/1R 3/3

ITEM:

GEAR TRAIN ASSEMBLY

FAILURE MODE: FAILS TO REMAIN IN POSITION, FREELY ROTATES

LEAD ANALYST: H.J. LOWERY SUBSYS LEAD: H.J. LOWERY

## BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM 2) STARTRACKER DOOR MECHANISM
- 3) GEAR TRAIN ASSEMBLY

4)

5)

6)

7)

8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING:	3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION:

STARTRACKER COMPARTMENT

PART NUMBER: TBD

CAUSES: MECHANICAL SHOCK, PIECE-PART FAILURE, STRUCTURAL

FAILURE, VIBRATION, OVERLOAD

EFFECTS/RATIONALE:

UNABLE TO OPEN/CLOSE STARTRACKER DOOR.

HIGHEST CRITICALITY HDW/FUNC 7/22/87 DATE: 3/3 FLIGHT: SUBSYSTEM: MECH/SDM 3/3 ABORT: 9108 MDAC ID: ALL ITEMS NOT SHOWN ON MDAC ID 9100-9107 ITEM: FAILURE MODE: ALL FAILURE MODES SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: H.J. LOWERY BREAKDOWN HIERARCHY: 1) MECHANICAL ACTUATION SYSTEM STARTRACKER DOOR MECHANISM 3) ALL REMAINING PARTS 4) 5) 6) 7) 8) 9)

CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	. ATO:	3/3
LANDING/SAFING	: 3/3		

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: STARTRACKER COMPARTMENT

PART NUMBER: ALL PARTS NOT SHOWN ON MDAC ID 9100-9107

CAUSES: ALL CAUSES

EFFECTS/RATIONALE:

FAILURE OF ALL PARTS NOT SHOWN ON MDAC ID 9100-9107 WILL HAVE NO EFFECT ON MISSION, VEHICLE OR CREW.

DATE: 7/23/87 HIGHEST CRITICALITY HDW/FUNC

SUBSYSTEM: MECH/SDM/EPD&C FLIGHT: 3/1R MDAC ID: 9500 ABORT: 3/3

ITEM: CIRCUIT BREAKER/SWITCH

FAILURE MODE: FAILS TO REMAIN CLOSED, FAILS TO CLOSE, STRUCTURAL

FAILURE, PREMATURE OPERATION, OPEN (ELECTRICAL)

LEAD ANALYST: H.J. LOWERY SUBSYS LEAD: H.J. LOWERY

#### BREAKDOWN HIERARCHY:

- 1) MECHANICAL ACTUATION SYSTEM
- 2) STARTRACKER DOOR MECHANISM
- 3) CIRCUIT BREAKER/SWITCH
- 4)
- 5)
- 6)
- 7) 8)
- 9)

#### CRITICALITIES

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	. 3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/1R	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3
LANDING/SAFING	: 3/3		

REDUNDANCY SCREENS: A [ 2 ] B [ P ] C [ P ]

LOCATION: PANEL 06, 014/5

PART NUMBER: S4-Y, S5-Z, CB 26/7

CAUSES: OVERLOAD, STRUCTURAL FAILURE, TEMPERATURE, VIBRATION,

INADVERTENT OPERATION/ACTIVATION

EFFECTS/RATIONALE:

UNABLE TO OPEN THE Y/Z STARTRACKER DOOR.

REFERENCES: SSSH DWG. NO. 2.4 SHEET 1-3, 9.6 SHEET 1, VS70-590202/9, -760709

HIGHEST CRITICALITY HDW/FUNC 7/23/87 DATE: 3/3 SUBSYSTEM: MECH/SDM/EPD&C FLIGHT: 3/3 ABORT: 9501 MDAC ID: ALL ITEMS NOT SHOWN ON MDAC ID 9500 ITEM: FAILURE MODE: ALL FAILURE MODES SUBSYS LEAD: H.J. LOWERY LEAD ANALYST: H.J. LOWERY BREAKDOWN HIERARCHY: MECHANICAL ACTUATION SYSTEM 1) STARTRACKER DOOR MECHANISM 2) 3) ALL REMAINING PARTS 4) 5) 6) 7) 8) 9)

FLIGHT PHASE	HDW/FUNC	ABORT	HDW/FUNC
PRELAUNCH:	3/3	RTLS:	3/3
LIFTOFF:	3/3	TAL:	3/3
ONORBIT:	3/3	AOA:	3/3
DEORBIT:	3/3	ATO:	3/3

CRITICALITIES

DEORBIT: 3/3 LANDING/SAFING: 3/3

REDUNDANCY SCREENS: A [ ] B [ ] C [ ]

LOCATION: ALL

PART NUMBER: ALL PARTS NOT SHOWN ON MDAC ID 9500

CAUSES: ALL CAUSES

EFFECTS/RATIONALE:

FAILURE OF ALL PARTS NOT SHOWN ON MDAC ID 9500 WILL HAVE NO EFFECT ON MISSION, VEHICLE OR CREW.

REFERENCES: SSSH DWG. NO. 2.4 SHEET 1-3, 9.6 SHEET 1, VS70-590202/9, -760709

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MDAC-ID	FLIGHT	ITEM	FAILURE MODE
	,		
1101	3/10	MOTOR GEARBOX PRESSURE LINE PROBE PROBE SHAFT +28V CONTACT #1 +28V CONTACT #2 +28V CONTACT #3 +28V CONTACT #3 +28V CONTACT #4 +28V CONTACT #4 +28V CONTACT #4 +28V CONTACT #2 +28V CONTACT #4 +28V CONTACT #4 +28V CONTACT #1 +28V CONTACT #2 +28V CONTACT #3 +28V CONTACT #4 +28V CONTACT #4 +28V CONTACT #4 +28V CONTACT #1 +28V CONTACT #2 +28V CONTACT #1 +28V CONTACT #3 +28V CONTACT #3 +28V CONTACT #3 +28V CONTACT #3 +28V CONTACT #4	FAILS TO OPERATE
1101	3/1E	CEADROV	TAMMED
1102	3/1R	CEADBOY	DDOVEN CEXD
1104	3/1D	DDECCIDE IINE	TENTACE
1104	3/1B	LESSORE TIME	TAMMED
1105	3/1R	PROBE	CIOCCED DODE
1100	3/1K	PRODE Cur em	PDOVEN
1107	3/1R	SUAFT	DENE
1100	3/1K	±20V COMMACM #1	DENI CHODMED
1500	3/1R	+28V CONTACT #1	FAILS SHOKIED
1501	3/1R	+28V CONTACT #1	FAILS OPEN
1502	3/1R	+28V CONTACT #2	FAILS SHOKIED
1202	3/1R	+28V CONTACT #2	FAILS OPEN
1504	3/1R	+26V CONTACT #3	FAILS SHORTED
1505	3/1K	+287 CONTACT #3	FAILS OPEN
1500	3/1R	+28V CONTACT #4	FAILS SHORIED
1507	3/1K	+287 CONTACT #4	FAILS OPEN
1505	3/1R	+28V CONTACT #1	FAILS OPEN
1211	3/1K	+28V CONTACT #2	FAILS OPEN
1212	3/1R	+28V CONTACT #3	FAILS OPEN
1515	3/1R	+28V CONTACT #4	FAILS OPEN
1210 TOTO	3/1K	+28V CONTACT #1	FAILS SHORTED
1210	3/1K	+28V CONTACT #2	FAILS SHORTED
1520	3/1R	+287 CONTACT #3	FAILS SHORTED
1522	3/1B	1207 CONTACT #4	FAILS SHORTED
1524	3/1R	+20V CONTACT #1	FAILS SHORTED
1520	3/1R	+28V CONTACT #2	FAILS SHORTED
1222	3/1R	+28V CONTACT #1	FAILS SHORTED
1533	3/1R	1287 CONTACT #1	FAILS OPEN
1224	3/1R	+20V CONTACT #2	FAILS SHORTED
1535	3/1R	+20V CONTACT #2	EXITS CHUDDED
1536	3/1R	+287 CONTACT #3	FAILS SHORTED
1537	3/1R	1287 CONTACT #4	FAILS OPEN
1530	3/1R	1287 CONTACT #4	FAILS SHORIED
1539	3/1R	+287 CONTACT #4	FAILS OPEN
1543	3/1R	+28V CONTACT #2	FAILS OPEN
1545	3/1R	+28V CONTACT #3	FAILS OPEN
1547	3/1R	+28V CONTACT #4	FAILS OPEN
1548	3/1R	+28V CONTACT #1	FAILS SHORTED
1550	3/1R	+28V CONTACT #2	FAILS SHORTED
1552	3/1R	+28V CONTACT #3	FAILS SHORTED
1554		+28V CONTACT #4	FAILS SHORTED
1556	3/1R	+28V CONTACT #4	FAILS SHORTED
1558	3/1R 3/1R	+28V CONTACT #2	FAILS SHORTED
1564	3/1R	INVERTED AND GATE	FAILS SHORTED
T204	3/ IK	INVENTED AND GATE	TALLO DIONIED

MDAC-ID	FLIGHT	ITEM	FAILURE MODE
		**************************************	
7565			FAILS OPEN FAILS SHORTED FAILS SHORTED FAILS SHORTED FAILS SHORTED FAILS OPEN FAILS OPEN FAILS SHORTED FAILS SHORTED FAILS SHORTED FAILS SHORTED FAILS OPEN FAILS OPEN FAILS SHORTED FAILS OPEN
1565	3/1R	INVERTED AND GATE	FAILS OPEN
1566	3/1R	INVERTED AND GATE	FAILS SHORTED
1567	3/1R	INVERTED AND GATE	FAILS OPEN
1568	3/1R	INVERTED AND GATE	FAILS SHORTED
1570	3/1R	INVERTED AND GATE	FAILS SHORTED
1572	3/1R	RELAY DRIVER	FAILS SHORTED
1573	3/1R	RELAY DRIVER	FAILS OPEN
1574	3/1R	RELAY DRIVER	FAILS SHORTED
1575	3/1R	RELAY DRIVER	FAILS OPEN
1576	3/1R	RELAY DRIVER	FAILS SHORTED
1578	3/ <u>1R</u>	RELAY DRIVER	FAILS SHORTED
1580	3/1R	RELAY	FAILS SHORTED
1581	3/1R	RELAY	FAILS OPEN
1582	3/1R	RELAY	FAILS SHORTED
1583	3/1R	RELAY	FAILS OPEN
1584	3/1R	RELAY	FAILS SHORTED
1586	3/1R	RELAY	FAILS SHORTED
1589	3/1R	AND GATE	FAILS OPEN
1591	3/1R	TIME DELAY	FAILS OPEN
1593	3/1R	SOLID STATE DRIVER	FAILS OPEN
1595	3/1R	REMOTE PWR CNTRLR	FAILS OPEN
1597	3/1R	REMOTE PWR CNTRLR	FAILS OPEN
1599	3/1R	REMOTE PWR CNTRLR	FAILS OPEN
1601	3/1R	SWITCH RELAY	FAILS OPEN
1603	3/1R	LATCH RELAY	FAILS OPEN
1605	3/1R	EMI FILTER	FAILS OPEN
1607	3/1R	OP AMP	FAILS OPEN
1609	3/1R	REGULATOR	FAILS OPEN
1610	3/1R	GENERATOR	FAILS SHORTED
1611	3/1R	GENERATOR	FAILS OPEN
1612	3/1R	CLOCK	FAILS SHORTED
1613	3/1R	CLOCK	FATIS OPEN
1615	3/1R	+O TRANSISTOR	FATIS OPEN
1617	3/1R	+Q TRANSISTOR -Q TRANSISTOR TRANSFORMER	FATIS ODEN
1619	3/1R	TRANSFORMER	FATIC CHODER
1621	3/1R	+10V AMP	FAILS OPEN
1623		-10V AMP	FAILS OPEN
1625	3/1R		FAILS OPEN
1627	3/1R	-10V TRANSISTOR	FAILS OPEN
1629	3/1R	DWD CUDDIV TECH AND	FAILS OPEN
1637	3/1R	PWR SUPPLY TEST AMP FLD EFFECT TRNSSTR	FAILS OPEN FAILS OPEN
1637	3/1R 3/1R	CONTROL CIRCUIT	FAILS OPEN FAILS OPEN
1640	3/1R 3/1R	READ ONLY MEMORY	
		READ ONLY MEMORY	FAILS SHORTED
1641	3/1R		FAILS OPEN
1645	3/1R	AMP	FAILS OPEN

MDAC-ID	FLIGHT	ITEM	FAILURE MODE
1647	3/1R	TRANSISTOR AND GATE AND GATE SRL SHFT REGISTER SRL SHFT REGISTER BINARY COUNTER BINARY COUNTER ADDRESSABLE SWITCH AMP	FATIS OPEN
1648	3/1P	AND CATE	FAILS SHORTED
1649	3/1R	AND CATE	FATIS ODEN
1650	3/1R	SDI SHET DEGISTED	FATIS SHOPPED
1651	3/1R	SDI SHET DEGISTED	FATIS ODEN
1652	3/10	RINARY COUNTED	FATIC CHODDED
1653	3/10	BINARY COUNTED	FATIS ODEN
1654	3/1R	ADDESCABLE SWITCH	FAILS OPEN
1655	3/1D	ADDRESSABLE SWITCH	FAILS SHORIED
1656	3/1R	ADDRESSABLE SWITCH	FAILS OPEN
1657	3/1R	AMP	FAILS SHORTED
1658	3/1R	CWITCHING INDEED	EXILG GRODMED
1650	3/1R	SWITCHING LADDER	FAILS SHORIED
1659	3/1K	DOLADIMU DEMECMOD	FAILS OPEN
1660	3/1K	POLARITI DETECTOR	FAILS SHORTED
1661	3/1R	COMPOSITION TO COMPOSITION	FAILS OPEN
1662	3 \ 1D	CONTROL LOGIC	FAILS SHOKTED
1003	3/1R	DEGLEMEN	FAILS OPEN
1004	3/1K	REGISTER	FAILS SHORTED
1005	3/1R	REGISTER	FAILS OPEN
1000	3/1K	DISCREET INPUT BFFR	FAILS SHORTED
100/	3/1R	DISCREET INPUT BFFR	FAILS OPEN
1663 1664 1665 1666 1667 1668 1669	3/1R	AMP SWITCHING LADDER SWITCHING LADDER POLARITY DETECTOR POLARITY DETECTOR CONTROL LOGIC CONTROL LOGIC REGISTER REGISTER DISCREET INPUT BFFR DISCREET INPUT BFFR SRL/PRLLEL CNVRTR SRL/PRLLEL CNVRTR OSCILLATOR OSCILLATOR 2 MH2 CLOCK 2 MH2 CLOCK 1 MH2 CLOCK 1 MH2 CLOCK 500 MH2 CLOCK 500 MH2 CLOCK COUNTER	FAILS SHORTED
1669	3/1R	SRL/PRLLEL CNVRTR	FAILS OPEN
1670 1671	3/1R	OSCILLATOR	FAILS SHORTED
16/1	3/1R	OSCILLATOR	FAILS OPEN
1672	3/1R	2 MH2 CLOCK	FAILS SHORTED
1673	3/1R	2 MH2 CLOCK	FAILS OPEN
1674	3/1R	1 MH2 CLOCK	FAILS SHORTED
1675	3/1R	1 MHZ CLOCK	FAILS OPEN
1676	3/1R	500 MHZ CLOCK	FAILS SHORTED
1677	3/1R	500 MH2 CLOCK	FAILS OPEN
1678	3/1R	COUNTER COUNTER OR GATE OR GATE	FAILS SHORTED FAILS OPEN FAILS SHORTED FAILS OPEN
	3/1K	COUNTER	FAILS OPEN
1680	3/1K	OR GATE	FAILS SHORTED
1681	3/1K	CENCOR WINDOW CUREN	LUTIO OLIM
1682	3/1R	SENSOR WINDOW GNRTK	FAILS SHORTED
1683	3/1R	SENSOR WINDOW GNRTR	FAILS OPEN
1684	3/1R	BUFFER	FAILS SHORTED
1685	3/1R	BUFFER	FAILS OPEN
1686	3/1R	OUTPUT CONTROL	FAILS SHORTED
1687	3/1R	OUTPUT CONTROL	FAILS OPEN
1688	3/1R	ENCODER	FAILS SHORTED
1689	3/1R	ENCODER	FAILS OPEN
1690	3/1R	AMP	FAILS SHORTED
1691	3/1R	AMP	FAILS OPEN

MDAC-ID	FLIGHT	ITEM	FAILURE MODE
1602	2 /1D	CPU	EATIC CHOPMED
1692	3/1R		FAILS SHORTED
1693 1694	3/1R 3/1R		FAILS OPEN
1695		SELECTOR LOGIC	FAILS SHORTED
1696	3/1R		FAILS OPEN FAILS SHORTED
1697	3/1R	READ ONLI MEMORI	FAILS SHORTED
1698	3/1R	ROM READ/WRITE MEMORY READ/WRITE MEMORY	FAILS OPEN
1699	3/1D	DEAD/WRITE MEMORI	FAILS SHORIED
2100	3/1R		
2101	1/1	DOD ACCEMBLY	PHYSICAL BINDING/JAMMING PHYSICAL BINDING/JAMMING PHYSICAL BINDING/JAMMING PHYSICAL BINDING/JAMMING PHYSICAL BINDING/JAMMING
2102	1/1	RELICEANY	PHISICAL DINDING/JAMMING
2102	1/1	BELLCDANK	DUVETOXI DINDING/JAMMING
2103	1/1	BOLT	PHYSICAL BINDING/JAMMING
2105	1/1	BOLT	PHYSICAL BINDING/JAMMING
3101	2/1R		FAILS TO START
3102	2/1R	CNTRLN MTR CLUTCH	
3102	2/1R	CENTERLINE MTR BRK	
3106	1/1	CNTRIN LTCH DEFRNTI.	PHYSICAL BINDING/JAMMING
3107	1/1	CNTRLN LTCH DFFRNTL	PARTIAL OUTPUT
3108	1/1	CENTERLINE LATCH	PHYSICAL BINDING/JAMMING
3109	2/18		PREMATURE OPERATION
3111	2/1R	CENTERLINE LATCH DOOR CLOSURE MTR	FAILS TO START
3112	2/1R	DOOR CLOSURE MTR	FAILS TO ENGAGE
3115	2/1R	DOOR CLOSURE MTR	FAILS TO DISENGAGE
3116	1/1	TOROUR IMT CITCH	PHYSICAL BINDING/JAMMING
3117	1/1	TOROUE LMT CLTCH	PARTIAL OUTPUT
3118	1/1	TORQUE LMT CLTCH DOOR LINKAGE ASSY	PHYSICAL BINDING/JAMMING
3119	1/1	DOOR LINKAGE ASSY	LINKAGE BROKEN/UNATTACHED
3120	1/1	HNGE LINKAGE ASSY	PHYSICAL BINDING/JAMMING
3121	1/1	HNGE LINKAGE ASSY	LINKAGE BROKEN/UNATTACHED
3122	1/1	DOOR CLOSURE TORQ	PHYSICAL BINDING/JAMMING
3123	1/1	DOOR CLOSURE TORQ	TORQUE TUBE BROKEN
3124	2/1R	DOOR CLOSURE LMT	PREMATURE OPERATION
3126	1/1	DOOR HINGE	PHYSICAL BINDING/JAMMING
3127	1/1	DOOR HINGE	STRUCTURAL FAILURE
3128	1/1	DOOR UPLATCH RLLR	BRKN OFF DOOR
3129	1/1	UMBILICAL DOOR	DAMAGED ON ASCENT
3130	2/1R	UPLOCK LATCH MTR	FAILS TO START
3131	2/1R	UPLATCH MTR CLTCH	FAILS TO ENGAGE
3134	2/1R	UPLATCH MOTOR BRK	FAILS TO DISENGAGE
3135	1/1	TRQ LIMIT CLTCH	PHYSICAL BINDING/JAMMING
3136	1/1	TRQ LIMIT CLTCH	PARTIAL OUTPUT
3137	7 / 7	UPLATCH TRO TUBE	PHYSICAL BINDING/JAMMING
3138	1/1	UPLATCH TRQ TUBE	TORQUE TUBE BROKEN
3139	1/1	INBOARD UPLCK LTCH	PHYSICAL BINDING/JAMMING

APPENDIX D
POTENTIAL CRITICAL ITEMS

MDAC-ID	FLIGHT	ITEM	FAILURE MODE
3140	1/1	INBOARD UPLCK LTCH	BROKEN/UNATTACHED
3141	$\frac{1}{1}$	UPLOCK LATCH MECH	•
3142	1/1	UPLOCK LATCH MECH	
3143	2/1R	READY TO LATCH LMT	
3501	2/1R	RELAY	FAILS TO CLOSE
3503	2/1R	RELAY	FAILS TO CLOSE
3507	2/1R	CNTLRN LTCH-STOW	FAILS TO SWITCH
3509	2/1R	ET UMBILICAL DR	FAILS TO SWITCH
3511	2/1R	READY TO LATCH LMT RELAY RELAY CNTLRN LTCH-STOW ET UMBILICAL DR ET UMBILICAL DR ET UMBILICAL DR ET UMBILICAL DR CONTROL BUS FUSE MCA AC PWR CRCT MCA RELAY LGC PWR REMOTE PWR CNTRLLR DIODE	FAILS TO SWITCH
3512	2/1R	ET UMBILICAL DR	FAILS TO SWITCH
3514	2/1R	ET UMBILICAL DR	FAILS TO SWITCH
3515	2/1R	CONTROL BUS FUSE	FAILS OUT OF TOL
3515 3516 3517	2/1R	MCA AC PWR CRCT	FAILS OUT OF TOL
3517	2/1R	MCA RELAY LGC PWR	FAILS OFF
3519	2/1R	REMOTE PWR CNTRLLR	FAILS OFF
3522	2/1R	DIODE	OPEN CIRCUIT
3524	2/1R	RESISTOR, 5.1K 1/4W	
3525	2/1R	RESISTOR, 5.1K 1/4W	OPEN CIRCUIT
3526	2/1R	RESISTOR, 5.1K 1/4W	RESISTANCE HIGHER
3527	2/1R		BLOWN
3528		•	
3529	2/1R		OPEN CIRCUIT
4101	1/1		FAILS MID-TRAVEL
4102	2/2	GLLTN/PRSSR CRTRDG	PREMATURE OPERATION
4103	1/1	NUT/BREECH	INTL/EXTL LEAKAGE
4104	1/1	MIT / RREECH	PREMATURE OPERATION
4105	2/1R	INPUT/OUTPUT SHAFT INPUT/OUTPUT SHAFT DEPLOY LIMIT SWTCH	PHYSICAL BNDNG/JAM
4106	2/1R	INDIT/OUT SHAFT	FAILS TO START/STOP
4109	2/1R	DEPLOY LIMIT SWICH	FAILS TO REMAIN OPEN
4110	2/1R	DEPLOY LIMIT SWICH	FAILS TO REMAIN CLSD
4111	2/1R 2/1R 2/1R 2/1R 3/2R 3/1R	GEAR TRAIN ASSY	PHYSICAL BINDING/JAM
4112	2/1R	GEAR TRAIN ASSY	FAILS TO RMN IN PSTN
4508	3/2R	+28V CONTACT #1	FAILS SHORTED
4509	3/1R	+28V CONTACT #1	FAILS OPEN
4510	3/2R	+28V CONTACT #2	FAILS SHORTED
4511		+28V CONTACT #2	FAILS OPEN
4512	3/2R	+28V CONTACT #3	
4512	3/1R	+28V CONTACT #3	FAILS OPEN
4514	3/2R	+28V CONTACT #4	FAILS SHORTED
4515			FAILS OPEN
	3/1R		FAILS SHORTED
		+28V CONTACT #1	FAILS OPEN
4518		+28V CONTACT #2	FAILS SHORTED
4519	3/2R	+28V CONTACT #2	FAILS OPEN
4520		+28V CONTACT #3	FAILS SHORTED
7720	3/ II	. 201 001.11101 113	

MDAC-ID	FLIGHT	ITEM	FAILURE MODE
4501	2 /2 2	LOCK COMMACH. #2	ELIC ODEN
4521	3/2R	+28V CONTACT #3	FAILS OPEN
4522	3/1R	+28V CONTACT #4 +28V CONTACT #4	FAILS SHORTED
4523	3/2R	+28V CONTACT #4	FAILS OPEN
4525	3/2R	+28V CONTACT #1	FAILS OPEN
4527	3/2R	+28V CONTACT #2	FAILS OPEN
4529	3/2R	+28V CONTACT #3	FAILS OPEN
4531	3/2R	+28V CONTACT #4	FAILS OPEN
4532	3/2R	+28V CONTACT #4 +28V CONTACT #1 +28V CONTACT #3 +28V CONTACT #4 +28V CONTACT #1 +28V CONTACT #1 +28V CONTACT #1 +28V CONTACT #2 +28V CONTACT #3 +28V CONTACT #3 +28V CONTACT #4 +28V CONTACT #4 +28V CONTACT #4 AND GATE #1 AND GATE #1 AND GATE #1 AND GATE #1 AND GATE #2 AND GATE #2 AND GATE #1 AND GATE #2 AND #1 AMP #1 AMP #1 AMP #2	FAILS SHORTED
4533	3/1R	+28V CONTACT #1	FAILS OPEN
4534	3/2R	+28V CONTACT #2	FAILS SHORTED
4535	3/1R	+28V CONTACT #2	FAILS OPEN
4536	3/2R	+28V CONTACT #3	FAILS SHORTED
4537	3/1R	+28V CONTACT #3	FAILS OPEN
4538	3/2R	+28V CONTACT #4	FAILS SHORTED
4539	3/1R	+28V CONTACT #4	FAILS OPEN
4543	3/2R	AND GATE #1	FAILS SHORTED
4544	3/1R	AND GATE #1	FAILS OPEN
4545	3/2R	AND GATE #2	FAILS SHORTED
4546	3/1R	AND GATE #2	FAILS OPEN
4547	3/1R	AND GATE #1	FAILS SHORTED
4548	3/2R	AND GATE #1	FAILS OPEN
4549	3/1R	AND GATE #2	FAILS SHORTED
4550	3/2R	AND GATE #2	FAILS OPEN
4551	3/2R	AMP #1 AMP #1 AMP #2 AMP #2 AMP #2 AMP #1 AMP #1 AMP #1 AMP #1 AMP #2 AMP #2	FAILS SHORTED
4552	3/1R	AMP #1	FAILS OPEN
4553	3/2R	AMP #2	FAILS SHORTED
4554	3/1R	AMP #2	FATIS OPEN
4555	3/1R	AMP #1	FATIS SHOPPED
4556	3/2R	ΔMD #1	FATIS OPEN
4557	3/10	AMD #2	FAILS CHODER
4558	3/2R	AMP #2	FAILS OPEN
4559	3/2R	K14	FAILS SHORTED
4560	3/1R	K14	FAILS SHORTED
4561	3/2R	K68	FAILS OPEN FAILS SHORTED
4562	3/1R	K68	FAILS SHORTED FAILS OPEN
4563			
4564	3/1R	K72	FAILS SHORTED
	3/2R	K72	FAILS OPEN
4565	3/1R	K70	FAILS SHORTED
4566	3/2R	K70	FAILS OPEN
4567	3/1R	STW MCRSWITCH #1	FAILS SHORTED
4569	3/2R	DPLY MCRSWTCH #1	FAILS SHORTED
4571	3/2R	AND GATE #1	FAILS SHORTED
4572	3/1R	AND GATE #1	FAILS OPEN
4573	3/2R	AND GATE #2	FAILS SHORTED
4574	3/1R	AND GATE #2	FAILS OPEN

. APPENDIX D
POTENTIAL CRITICAL ITEMS

MDAC-ID	FLIGHT	ITEM	FAILURE MODE
4575	3/1R		FAILS SHORTED
4576		AND GATE #1	FAILS OPEN
4577	3/1R	AND GATE #2	FAILS SHORTED FAILS OPEN
4578	3/2R		
4579	3/2R	AMP #1	FAILS SHORTED
4580	3/1R	AMP #1	FAILS OPEN
4581	3/2R	AMP #2	FAILS SHORTED
4582	3/1R	AMP #2	FAILS OPEN FAILS SHORTED FAILS OPEN FAILS SHORTED FAILS OPEN FAILS SHORTED
4583	3/1R	AMP #1 AMP #1	FAILS SHORTED
4584	3/2R	AMP #1	FAILS OPEN
4585	3/1R	AMP #2	FAILS SHORTED
4586	3/2R	AMP #2	FAILS OPEN
4587	3/2R	K25 .	FAILS SHORTED
4588	3/12	K25	FAILS OPEN
4589	3/2R	K2	FAILS SHORTED
4591	3/1R	K2	FAILS OPEN
4592	3/1R	K27	FAILS SHORTED
4593	3/2R	K27	FAILS OPEN
4594	3/1R		FAILS SHORTED
4595	3/2R		FAILS OPEN
4596	3/1R	STW MCRSWITCH #2	FAILS SHORTED
4598	3/2R	DPLY MCRSWITCH #2	FAILS SHORTED
4600	3/1R	+28V CONTACT #1	FAILS SHORTED
4601	3/1R	+28V CONTACT #1	FAILS OPEN
4602	3/1R	+28V CONTACT #2	FAILS SHORTED
4603	3/1R	+28V CONTACT #2	FAILS OPEN
4604	3/1R 3/1R 3/1R 3/1R 3/1R	+28V CONTACT #3	FAILS SHORTED
4605	3/1R	+28V CONTACT #3	FAILS OPEN
4606	3/1R	+28V CONTACT #4	FAILS SHORTED
4607	3/1R	+28V CONTACT #4	FAILS OPEN
4616	3/1R	+28V CONTACT #1	FAILS SHORTED
4617	3/1R	+28V CONTACT #1	FAILS OPEN
4618	3/1R		FAILS SHORTED
4619	3/1R	+28V CONTACT #2	FAILS OPEN
4624	3/1R	AND GATE #1	FAILS SHORTED
4625	3/1R	AND GATE #1	FAILS OPEN
4626	3/1R		FAILS SHORTED
4627	3/1R	AND GATE #2 AND GATE #2	FAILS OPEN
4628	3/1R	40 MS TIME DELAY	FAILS SHORTED
4629	3/1R	40 MS TIME DELAY	FAILS OPEN
4630	3/1R	AMP #1	FAILS SHORTED
4631	3/1R	AMP #1	FAILS OPEN
4632	3/1R	AND GATE #3	FAILS SHORTED
4633	3/1R	AND GATE #3	FAILS OPEN
4634	3/1R	4 SECOND TIME DELAY	
	-,		

MDAC-ID	FLIGHT	ITEM	FAILURE MODE
	production of the second		
4635	3/1R	4 SECOND TIME DELAY	FAILS OPEN
4636	3/1R	AMP #3	FAILS SHORTED
4637	3/1R	AMP #3 AMP #3	FAILS OPEN
4639	3/1R	EXPLOSIVE INITIATOR	FAILS OPEN
4640	3/1R	EXPLOSIVE INITIATOR EXPLOSIVE INITIATOR EXPLOSIVE INITIATOR EXPLOSIVE INITIATOR AND GATE #1 AND GATE #1 AND GATE #2 AND GATE #2 40 MS TIME DELAY 40 MS TIME DELAY AMP #1 AMP #1 AMP #1 AND GATE #3 AND GATE #3 4 SECOND TIME DELAY	FAILS SHORTED
4641	3/1R	EXPLOSIVE INITIATOR	FAILS OPEN
4642	3/1R	AND GATE #1	FAILS SHORTED
4643	3/1R	AND GATE #1	FAILS OPEN
4644	3/1R	AND GATE #2	FAILS SHORTED
4645	3/1R	AND GATE #2	FAILS OPEN
4646	3/1R	40 MS TIME DELAY	FAILS SHORTED
4647	3/1R	40 MS TIME DELAY	FAILS OPEN
4648	3/1R	. AMP #1	FÄILS SHORTED
4649	3/1R	AMP #1	FAILS OPEN
4650	3/1R	AND GATE #3	FAILS SHORTED
4651	3/1R	AND GATE #3	FAILS OPEN
4652	3/1R	4 SECOND TIME DELAY	FAILS SHORTED
4653	3/1R	4 SECOND TIME DELAY	FAILS ON
4654	3/1R	AMP #3	FAILS SHORTED
4655	3/1R	4 SECOND TIME DELAY AMP #3 AMP #3	FAILS OPEN
4656	3/1R	EXPLOSIVE INITIATOR	FAILS SHORTED
4657	3/1R	EXPLOSIVE INITIATOR	FAILS OPEN
4658	3/1R	EXPLOSIVE INITIATOR EXPLOSIVE INITIATOR EXPLOSIVE INITIATOR AMP #2 AMP #2 AMP #2 AMP #2 CONVERTER CONVERTER INVERTED AND GATE INVERTED AND GATE CAPACITOR BANK CAPACITOR BANK	FAILS SHORTED
4659	3/1R	EXPLOSIVE INITIATOR	FAILS OPEN
4660	3/1R	AMP #2	FAILS SHORTED
4661	3/1R	AMP #2	FAILS OPEN
4662	3/1R	AMP #2	FAILS SHORTED
4663	3/1R	AMP #2	FAILS OPEN
4664	3/1R	CONVERTER	FAILS SHORTED
4665	3/1R	CONVERTER	FAILS OPEN
4666	3/1R	INVERTED AND GATE	FAILS SHORTED
4667	3/1R	INVERTED AND GATE	FAILS OPEN
4668	3/1R	CAPACITOR BANK	FAILS SHORTED
	-,		
4670	3/1R	AND GATE	FAILS SHORTED
4671	3/1R	AND GATE	FAILS OPEN
4674	3/1R	TEST LOGIC	FAILS SHORTED
4675	3/1R	TEST LOGIC	FAILS OPEN
4676	3/1R	CONVERTER	FAILS SHORTED
4677	3/1R	CONVERTER	FAILS OPEN
4678	3/1R	INVERTED AND GATE	FAILS SHORTED
4679	3/1R	INVERTED AND GATE	FAILS OPEN
4680	3/1R	CAPACITOR BANK	FAILS SHORTED
4681	3/1R	CAPACITOR BANK	FAILS OPEN

MDAC-ID	FLIGHT	ITEM	FAILURE MODE
4682	3/1R	AND GATE	FAILS SHORTED
4683	3/1R	AND GATE	FAILS OPEN
4003	3/1R	AND GATE AND GATE TEST LOGIC TEST LOGIC CNTRLN/BLKHD LTH MTR CNTRLN/BLKHD LTH MTR CNTRLN/BLKHD LTH MTR CNTRLN/BLKHD LTH MTR CNTRLN/BLKHD LTH GNG CNTRLN/BLKHD LTH GNG CNTRLN/BLKHD LTH GNG CNTRLN/BLKHD LTH GNG CNTRLN/BLKHD TRQ LMT	FAILS SHOPPED
4686	3/1R	TEST LOGIC	FAILS SHOKIED
4687	3/1K	CAMBINAL TOOLS	IOSS OF OURDING
5101	2/1R	CNTREN/BERND LIN MIR	EXILE MO ENCACE
5102	2/1R	CNTRLN/BLKHD LTH MTR	FAILS TO ENGAGE
5104	2/1R	CNTRLN/BLAND LTH MTR	FAILS TO DISENGAGE
5106 5107	2/1R	CNTRLN/BLKHD LTH MTR	PULLS OF CHADIA
5107	1/1	CNTRLN/BLKHD LTH GNG	LOSS OF OUTPUT
5108	2/1R	CNTRLN/BLKHD LTH GNG	PARTIAL OUTPUT
5109	1/1	CNTRLN/BLKHD LTH GNG	PHYSICAL BINDING/JAM
5110	1/1	CNTRLN/BLKHD TRQ LMT	FAILS TO OPERATE
5111	1/1	CNTRLN/BLKHD TRQ LMT	FAILS OUT OF TOL
5112	1/1	CNTRLN/BLKHD TRQ LMT	FAILS OUT OF TOL
5113	1/1	CNTRLN/BLKHD GRBX	FAILS TO TRNSFR MTR
5114	1/1	CNTRLN/BLKHD GRBX	PHYSICAL BINDING/JAM
5115	1/1	CNTRLN/BLKHD GRBX	PARTIAL OUTPUT
5119	2/1R	CNTRLN/BLKHD CLS LMT	PREMATURE OPERATION
5120	1/1	CNTRLN LTCH GNG TRQ	BROKEN
5121	1/1	CNTRLN/BLKHD GRBX CNTRLN/BLKHD GRBX CNTRLN/BLKHD GRBX CNTRLN/BLKHD CLS LMT CNTRLN LTCH GNG TRQ CNTRLN LTCH GNG TRQ CNTRLN LTCH ASSY CNTRLN LTCH ASSY CNTRLN LTCH RLLR PBD SHEAR FTTNG RLLR PBD SHEAR FTTNG RLLR PBD SHEAR FTTNG RLLR PBD SHEAR FTTNG CLAW PBD SHEAR FTTNG CLAW	PHYSICAL BINDING/JAM
. 5122	1/1	CNTRLN LTCH ASSY	PHYSICAL BINDING/JAM
5123	2/1R	CNTRLN LTCH ASSY	BROKEN COMPONENT
5125	2/1R	CNTRLN LTCH RLLR	PHYSICAL BINDING/JAM
5127	2/1R	PBD SHEAR FTTNG RLLR	FAILS TO ENGAGE CLAW
5128	2/1R	PBD SHEAR FTTNG RLLR	BROKEN
5129	2/1R	PBD SHEAR FTTNG RLLR	PHYSICAL BINDING/JAM
5130	2/1R	PBD SHEAR FTTNG CLAW	FAILS TO ENGAGE ROLLER
5131	2/1R	PBD SHEAR FTTNG CLAW	BROKEN
5132	2/1R	PBD SHEAR FTTNG CLAW	BENT
5133	2/1R	BLKHD LATCH GANG	PHYSICAL BINDING/JAM
5134	2/1R	BLKHD LATCH GANG	BROKEN
5135	2/1R	BLKHD PSH-PLL RD	PHYSICAL BINDING/JAM
5136	2/1R	BLKHD PSH-PLL RD BLKHD PSH-PLL RD	BROKEN
5137	2/1R	BLKHD LTCH LNKG	PHYSICAL BINDING/JAM
5138	2/1R	BLKHD LTCH LNKG	BROKEN
5139	2/1R	BLKHD LTCH LNKG	FAILS TO LATCH
5140	2/1R	BLKHD RLLR ASSY	PHYSICAL BINDING/JAM
5143	2/1R	BLKHD DR CLSD SWTCH	PREMATURE OPERATION
5145	2/1R	BLKHD RDY-TO-LTCH SW	PREMATURE OPERATION
5146	2/1R	PYLD BY DR DRV MTR	LOSS OF OUTPUT
5147	2/1R	PYLD BY DR DRV CL	FAILS TO ENGAGE
5149	2/1R	PYLD BY DR DRV BK	FAILS TO DISENGAGE
5151	2/1R	PYLD BY DR DRV CL	SLIPS
5152	1/1	PYLD BY DR DRV	LOSS OF OUTPUT
5153	2/2	PYLD BY DR DRV	PARTIAL OUTPUT
	-, -		

5154 5155	1/1	PYLD BY DR DRV	PHYSICAL BINDING/JAM
5156	1/1	PVID BY DR DRV	FAILS TO OPERATE PHYSICAL BINDING/JAM
5157	2/2	PYLD BY DR DRV	DADTAL OUTDING
5158	1/1	DVID BY DD DRV	PHYSICAL BINDING/JAM PARTIAL OUTPUT BROKEN SEIZED BEARING PHYSICAL BINDING/JAM BROKEN SUPPORT SHAFT FAILS OUT OF TOL TORQUE LIMITER FAILS JAMMED ROTARY ACT ROTARY ACTUATOR OUTPUT BROKEN MOUNTING BRACKET PHYSICAL BINDING/JAM WARPED DAMAGED PANEL PHYSICAL BINDING/JAM SHORTS OPEN CIRCUIT RESISTANCE HIGHER FAILS TO SWITCH OPEN FAILS TO CLOSE SHORTS RESISTANCE HIGHER FAILS TO CLOSE FAILS TO OPEN OPEN FAILS TO OPEN OPEN FAILS OFF CLOGGED LEAKAGE LEAKAGE CRACKED LEAKAGE BROKEN GEAR BROKEN SHAFT JAMMED BROKEN GEAR
5159	2/1D	DVID BY DD DDVG	CTTTT DEADING
5160	1/1	DVID BY DR DRVS	DUVETONI DINDING / TAM
5161	1/1	PILO DI DA DAV	PROVEN CURRORM CHARM
5163	1/1	DATU BY DE DEAD	EXTIC OUT OF TO
5164	1/1	DATU BY DE DEAD	MADAIR ITMINED EXTIC
5165	1/1	DVID BY DR DRVR	TANGED DOMARY ACT
5166	1/1	DVID BY DR DRVR	DOMARY ACTUATION OF THE PROPERTY OF THE PROPER
5167	1/ ± 2/1D	DVID BY DR DRVD	PROPER MOINMENT DRACKEM
5165 5166 5167 5168	2/ 4R 1/1	DAID BY DE DEAK	DUVELONI DINDING (TAM
5174	1/1	DAVIOAD BAY DOOD	PRISICAL BINDING/JAM
5175	1/1	PATLOAD BAY DOOR	NAKPED DAVIZED DAVEY
5176	1/ 1 2/1D	PAYLOAD BAY DOOR	DAMAGED PANEL
5501	2/1R	COMMON BILL 1 2K	PHYSICAL BINDING/JAM
5502	2/1R	CONTROL BUS 1.2K	SHUKTS
5502 5503	2/1R	CONTROL BUS 1.2K	OPEN CIRCUIT
2202	2/1R	DAVIOLD BAY DOOR	RESISTANCE HIGHER
5504 5505	2/1R	PAILOAD BAY DOOR	FAILS TO SWITCH
5505	2/1R	PUNE, IA	OPEN
5506 5507	2/1K	PAYLOAD BAY DOOK	FAILS TO SWITCH
5507	2/1R	MAIN DC BUS RELAY	FAILS TO CLOSE
5511	2/1R	SWITCH RESISTOR	SHORTS
2277	2/1R	SWITCH RESISTOR	RESISTANCE HIGHER
5514	2/1R	PAYLOAD BAY DOOR	FAILS TO CLOSE
2212	2/1R	PAYLOAD BAY DOOR	FAILS TO OPEN
5513 5514 5515 5516 5517 5519	2/1R	MCA AC POWER CRCT	OPEN
221/	2/1R	MCA RELAY LOGIC PWR	FAILS OFF
2273	2/1R	REMOTE POWER CNTRLLR	FAILS OFF
7100	3/1K	PRESSURE PORT	CLOGGED
7101	1/1	PRESSURE PORT	LEAKAGE
7102	3/1K	O RING	LEAKAGE
7103	3/1K	U RING	CRACKED
7104	3/1K	VIEWPORT	LEAKAGE
7106	3/1R	ACTUATOR	BROKEN GEAR
7107	3/1K	ACTUATOR	BROKEN SHAFT
7108	3/1R	ACTUATOR	JAMMED
7109	3/2R		
7110	3/2R	ACTUATOR	BROKEN SHAFT
7111	3/2R	ACTUATOR	JAMMED
7112	3/1R	O RING	CRACKED
7113	3/1R	O RING	LEAKAGE
7114	3/1R	VIEWPORT	LEAKAGE
8100	2/1R	ROD ASSEMBLY	PHYSICAL BINDING/JAM
8101	2/1R	BELLCRANK	PHYSICAL BINDING/JAM
8102	2/1R	BOLT/BRACKET/DBLR	PHYSICAL BINDING/JAM
8103	2/1R	INPUT/OUTPUT TRQ	PHYSICAL BINDING/JAM
8104	2/1R	INPUT/OUTPUT TRQ	FAILS TO START/STOP
8105	2/1R	DIFFERENTIAL/GEAR	PHYSICAL BINDING/JAM
8106	2/1R	DIFFERENTIAL/GEAR	FAILS TO REMAIN IN POS

APPENDIX D
POTENTIAL CRITICAL ITEMS

MDAC-ID	FLIGHT	ITEM	FAILURE MODE
8107	2/1R	MCRSWTCH PSTN IND	FAILS TO REMAIN OPEN
8108	2/1R	MCRSWTCH PSTN IND	FAILS TO REMAIN CLOSED
8501	2/1R	ACTUATOR MOTOR	PREMATURE OPERATION
8502	2/1R	ACTUATOR SWTCH MDL	OPEN
8503	2/1R	MCA AC POWER RELAY	PARTIAL OUTPUT
8504	2/1R	MCA PURGE SGNL DRVR	ERRONEOUS OUTPUT
8505	2/1R	MCA DC POWER BUS	OPEN
8506	2/1R	MCA AC POWER BUS	OPEN
8507	2/1R	MCA DIODE	OPEN
8508	2/1R	MCA DIODE	SHORTED
8509	2/1R	ELECTRICAL CON	OPEN
8510	2/1R	CABLES/WIRING	OPEN
8511	2/1R	MOD/DEMOD	DELAYED OPERATION
8512	2/1R	MOD/DEMOD	INADVERTENT OPERATION
8513	2/1R	GPC SOFTWARE	INADVERTENT OPERATION
8514	2/1R	FUSE	OPEN
8515	2/1R	RESISTOR	SHORTED
8516	2/1R	RESISTOR	OPEN
8517	2/1R	GPC SOFTWARE	DELAYED OPERATION

F-92